THE MALACOLOGICAL SOCIETY OF LONDON

England & Wales · Charity number 275980

Details

Status	Registered
Legal form	Other
Registered	1978-07-03
Register	View on the Charity Commission register

Contact

Address	Natural History Museum Cromwell Road London SW7 5BD
Phone	01223221631
Email	kl@bas.ac.uk
Website	www.malacsoc.org.uk

Activities

Objects: TO ADVANCE EDUCATION, RESEARCH AND LEARNING FOR THE PUBLIC BENEFIT IN THE STUDY OF MOLLUSCS FROM BOTH PURE AND APPLIED ASPECTS.

Activities: Supports research in every aspect of malacology.

Classification

- **How:** Makes Grants To Individuals, Sponsors Or Undertakes Research
- **What:** Education/training, Animals, Environment/conservation/heritage
- **Who:** Other Defined Groups

Geography

- Australia
- Czech Republic
- Italy
- Japan
- Spain
- United States
- Throughout England And Wales

Finances

Period end	Income	Expenditure	Assets	Employees
2024-12-31	£47,891	£28,346	-	-
2023-12-31	£50,720	£51,414	-	-
2022-12-31	£49,333	£35,723	-	-
2021-12-31	£55,980	£23,863	-	-
2020-12-31	£54,844	£31,621	-	-

Trustees

Name	Role	Appointed
Jonathan Ablett	Chair	2016-04-13
Debbie Wall-Palmer PhD		2021-03-24
Dr Fiona Elizabeth Allan		2025-04-30
Dr KATRIN LINSE PHD		
Dr Tom White		2024-03-06
Harriet Wood		2020-06-04

THE MALACOLOGICAL SOCIETY OF LONDON

England & Wales - Charity number 275980

Accounts

Malacological Society of London AGM 2025

FINANCIAL REPORT for 2024 by Honorary Treasurer, Dr Tom S. White

Finance for the financial year ending 31st December 2024

Firstly, I would like to express my sincere thanks to my predecessor, Dr Katrin Linse, for her careful stewardship of the Society's finances, which have continued to remain stable during 2024; the Society is in excellent financial health, with plenty of reserves should income become an issue.

The Society again enjoyed an overall gain of £19,545.16, largely due to the profit share from the *Journal of Molluscan Studies* and gains in the Fixed Interest and Investment funds. Higher expenditure on awards and meetings was made in 2023 (compared with previous years), and this trend continued in 2024, drawing mainly on income from Oxford University Press.

As of 31st December 2024, the total funds of the Malacological Society of London are £581,559.53, of which £118,362.81 are in cash deposits, and £463,196.72 in its COIF investment funds. During 2024, no funds were transferred from the current account to savings accounts.

In 2024 the main charitable activities were the funding of ECR and SCR research projects (total cost of £11,865), supporting students to attend conferences (£2,842.94) and the Molluscan Forum (£1,510). The Annual Award was also made (£500). These figures are lower than in 2023 due to several recipients claiming their awards in January 2025, due to the timing of the awards round.

Separately, the profit-share from the publication of the *Journal of Molluscan Studies* (*JMS*) in 2024 provided the Society with most of its income to its cash account, contributing £42,399, a slight reduction on the £44,092 received in 2023. The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal.

In 2024, travel and meeting related spending was £2,243.06 / £5,819, a reduction on the much higher spending in 2023 (£9,815 / £8,577) and in line with expenditure in 2022 (£2840 / £6423). Overall expenditure was lower than in 2023, but given the gains being made in the investment funds it will be worth discussing how to balance the need to maintain a financial cushion for the Society with an uplift in spending for future awards rounds.

Dr Tom S. White

30 April 2024

Malacological Society of London
Accounts 2024 (01.01.2024 – 31.12.2024)

Income

	Subscriptions		**Profit share (Journal)**	**Book sales (NHBS)**
2024	Subs (direct)	Subs (Stripe)		
Jan	£495.00	£1,165.71		£2.40
Feb	£45.00	£604.43		£0.60
Mar		£132.36		£0.60
April		£111.96		£4.20
May		£24.42		
June		£112.23		£16.20
July				£5.40
Aug		£43.67	£42,399.00	£3.00
Sept				
Oct		£43.34		
Nov		£43.34		
Dec				
Totals	**£540.00**	**£2,281.46**	**£42,399.00**	**£32.40**

Expenditure

		Awards		**Publica**
2024	Research Awards	Travel Awards	Annual Award	JMS
Jan		£598.00		£887.00
Feb				
Mar		£630.38		
April		£814.56		
May				
June				
July	£4,365.00	£300.00		
Aug	£4,500.00	£500.00		
Sept				£887.00
Oct	£3,000.00			
Nov				
Dec			£500.00	
Totals	**£11,865.00**	**£2,842.94**	**£500.00**	**£1,774.00**

Furtherance of objectives	**£24,147.52**
Cost of Council meetings	**£2,565.57**
Management and admin	**£1,632.57**

Assets (as of 31st Dec. 2024)

COIF Investment Fund	£355,633.44
COIF Bond Fund	£105,234.12
COIF Deposit Fund	£2,329.16
Bank (HSBC Current Account)	£118,362.81
Total	**£581,559.53**

COIF investments	
£584.36	
£642.79	
£742.97	
£667.84	
£2,637.96	**£47,890.82**

ıtions	**AGM/Forum**		**Council**	
Malacologist	Travel bursaries	Catering	Travel to meetings	AGM dinner
			£260.30	
		£2,134.80	£239.12	£322.51
			£212.65	
£159.04				
	£1,510.00	£3,361.74	£1,251.38	
			£279.61	
£159.04	**£1,510.00**	**£5,496.54**	**£2,243.06**	**£322.51**

		Admin		
Bank charges	Payment charges	Accountant	
£11.00	£17.00		
£11.00			
£11.00	£0.24		
£11.00	£17.00		
£11.00		£1,308.00	
£11.00			
£11.00	£79.97		
£11.00	£47.78		
£11.00			
£11.00	£30.58		
£11.00			
£11.00			
£132.00	**£192.57**	**£1,308.00**	**£28,345.66**

Malacological Society of London
HSBC Bank account running totals

Date	Type	Description
2-Jan-24	CR	Hutchinson John SUB FOR H REISE
2-Jan-24	CR	SUBSCRIPTION BAYNES AL
2-Jan-24	CR	MR GRAHAME GRAHAME JW&E
2-Jan-24	CR	DG HERBERT SUBS HERBERT D G
2-Jan-24	CR	CLEMENTS R&J PAM
2-Jan-24	CR	ROLLINSON D+EA SUB
2-Jan-24	CR	TURNER L M V03
2-Jan-24	CR	ANTHONY WALKER WALKER
2-Jan-24	CR	Dussart Georges G B J DUSSART
2-Jan-24	CR	Cameron Robert
4-Jan-24	CR	N H B S LTD MAIN
5-Jan-24	CR	JARVIS S S C JARVIS ANNUAL
5-Jan-24	CR	Stripe Payments UK STRIPE
8-Jan-24	CR	Stripe Payments UK STRIPE
9-Jan-24	CR	Stripe Payments UK STRIPE
11-Jan-24	DR	TOTAL CHARGES TO 20DEC2023
11-Jan-24	CR	Stripe Payments UK STRIPE
12-Jan-24	CR	Stripe Payments UK STRIPE
15-Jan-24	CR	Stripe Payments UK STRIPE
16-Jan-24	CR	Stripe Payments UK STRIPE
17-Jan-24	CR	Stripe Payments UK STRIPE
18-Jan-24	CR	Stripe Payments UK STRIPE
22-Jan-24	CR	Stripe Payments UK STRIPE
23-Jan-24	CR	Stripe Payments UK STRIPE
24-Jan-24	CR	Stripe Payments UK STRIPE
30-Jan-24	BP	Katrin Linse MSL CM 17 Jan
30-Jan-24	BP	Harriet Wood MalacSoc
30-Jan-24	BP	John Grahame MSL CM 17 Jan
30-Jan-24	BP	DINARZARDE RAHEEM Bangalore
30-Jan-24	BP	DINARZARDE RAHEEM JMSEDITSUPPORT1/2
30-Jan-24	DR	MSL TRAVEL AWARD RBD30014KH2S0YYO W M K
30-Jan-24	DR	MSL TRAVEL AWARD RBD30014KH2S0YYO PAYMI
1-Feb-24	CR	MALACSOC NOBLE LR
1-Feb-24	CR	Stripe Payments UK STRIPE
2-Feb-24	CR	Stripe Payments UK STRIPE
5-Feb-24	CR	Stripe Payments UK STRIPE
6-Feb-24	CR	Stripe Payments UK STRIPE
7-Feb-24	CR	Stripe Payments UK STRIPE
8-Feb-24	CR	N H B S LTD MAIN
11-Feb-24	DR	TOTAL CHARGES TO 20JAN2024
15-Feb-24	CR	Stripe Payments UK STRIPE

16-Feb-24	CR	Stripe Payments UK STRIPE
20-Feb-24	CR	Stripe Payments UK STRIPE
29-Feb-24	CR	CCLA Investment Ma CO3075139, Malacol
1-Mar-24	BP	J D Ablett AGM reception
7-Mar-24	CR	N H B S LTD MAIN
8-Mar-24	CR	Stripe Payments UK STRIPE
8-Mar-24	BP	J D Ablett AGM 2024 dinner
8-Mar-24	BP	Benugo I8043010001906
8-Mar-24	BP	Alan Hodgson AGM 2024
11-Mar-24	DR	AGM 2024 EXPENSE RBD11034JE6A8LMP FERNAI
11-Mar-24	DR	AGM 2024 EXPENSE RBD11034JE6A8LMP PAYME
11-Mar-24	CR	Stripe Payments UK STRIPE
13-Mar-24	DR	TOTAL CHARGES TO 20FEB2024
4-Apr-24	CR	N H B S LTD MAIN
5-Apr-24	CR	Stripe Payments UK STRIPE
5-Apr-24	BP	Louise Firth MSL AGM
5-Apr-24	DR	MSL AGM2024 RBD05044HS8TVKXS JUAN SEMPE
5-Apr-24	DR	MSL AGM2024 RBD05044HS8TVKXS PAYMENT CH
9-Apr-24	CR	Stripe Payments UK STRIPE
11-Apr-24	DR	TOTAL CHARGES TO 20MAR2024
23-Apr-24	CR	Stripe Payments UK STRIPE
12-May-24	DR	TOTAL CHARGES TO 20APR2024
23-May-24	CR	Stripe Payments UK STRIPE
30-May-24	BP	Staffords Inv 32941
31-May-24	CR	CCLA Investment Ma CO3075139, Malacol
6-Jun-24	CR	N H B S LTD MAIN
11-Jun-24	DR	TOTAL CHARGES TO 20MAY2024
11-Jun-24	CR	Stripe Payments UK STRIPE
14-Jun-24	CR	Stripe Payments UK STRIPE
20-Jun-24	CR	Stripe Payments UK STRIPE
4-Jul-24	CR	N H B S LTD MAIN
5-Jul-24	DR	CRICHARDS RBD05074E9H4TYV5 CASEY S RICHAR
5-Jul-24	DR	CRICHARDS RBD05074E9H4TYV5 PAYMENT CHAR
5-Jul-24	BP	Alan Hodgson CM 22062022
5-Jul-24	DR	GSPAGLIARDI RBD05074EKH4WGAO GIADA SPAG
5-Jul-24	DR	GSPAGLIARDI RBD05074EKH4WGAO PAYMENT CI
5-Jul-24	DR	LANDRO MSL RA RBD05074EAH4WYKH SONIA MA
5-Jul-24	DR	LANDRO MSL RA RBD05074EAH4WYKH PAYMENT
5-Jul-24	DR	NURHAYATI MSL TG RBD05074G6H4Y343 PUTRI
5-Jul-24	DR	NURHAYATI MSL TG RBD05074G6H4Y343 PAYME
5-Jul-24	BP	John Grahame CM 12062024
8-Jul-24	DR	NURHAYATI MSL TG RBP08074IVHET7EP HSBC Ba
12-Jul-24	DR	TOTAL CHARGES TO 20JUN2024
6-Aug-24	CR	Stripe Payments UK STRIPE
7-Aug-24	BP	GBJ Dussart Malacologist Feb24

7-Aug-24	BP	Lauren R Eggleton Eggleton Travel
7-Aug-24	DR	ISHII MSL ECRA RBD07084JFK5DQDC YASUTO ISH
7-Aug-24	DR	ISHII MSL ECRA RBD07084JFK5DQDC PAYMENT CI
7-Aug-24	BP	Andrew Torres Torres ECR Award
7-Aug-24	DR	MARTOS ECR GRANT RBD07084EAK5EHHD BRIAN
7-Aug-24	DR	MARTOS ECR GRANT RBD07084EAK5EHHD PAYM
8-Aug-24	CR	N H B S LTD MAIN
9-Aug-24	DR	ISHII MSL ECRA RBP09084HSKBPMRK HSBC Bank
11-Aug-24	DR	TOTAL CHARGES TO 20JUL2024
21-Aug-24	CR	OXFORD UNIVERSITY
30-Aug-24	CR	CCLA Investment Ma CO3075139, Malacol
11-Sep-24	DR	TOTAL CHARGES TO 20AUG2024
18-Sep-24	BP	DINARZARDE RAHEEM JMSEDITSUPPORT2/2
1-Oct-24	DR	NG MSL R AWARD RBD01104G7P6JQWX UNIVERS
1-Oct-24	DR	NG MSL R AWARD RBD01104G7P6JQWX PAYMEN
12-Oct-24	DR	TOTAL CHARGES TO 20SEP2024
16-Oct-24	DR	BREURE MSL SRG RBD16104JEQHBC00 A.S.H. BRE
16-Oct-24	DR	BREURE MSL SRG RBD16104JEQHBC00 PAYMENT
18-Oct-24	DR	MARTOS ECR GRANT RBP18104EKQQHE4G HSBC
22-Oct-24	CR	Stripe Payments UK STRIPE
11-Nov-24	DR	TOTAL CHARGES TO 20OCT2024
11-Nov-24	BP	Alan Hodgson CM 02102024
18-Nov-24	BP	Benugo I8043010002237
20-Nov-24	CR	Stripe Payments UK STRIPE
28-Nov-24	BP	PHILIP R HOLLYMAN Forum Tr awards 24
28-Nov-24	BP	PHILIP R HOLLYMAN Forum Travel Accom
28-Nov-24	BP	Alan Hodgson Hodgson Forum 2024
28-Nov-24	BP	T S White Forum Consumables
29-Nov-24	DR	SPAGLIARDI FORUM RBD29114HTUIBD4Y GIADA S
29-Nov-24	DR	SPAGLIARDI FORUM RBD29114HTUIBD4Y PAYME
29-Nov-24	BP	Harriet Wood MSL Forum Travel
29-Nov-24	BP	Rowan Whittle MSL Forum Travel
29-Nov-24	CR	CCLA Investment Ma CO3075139, Malacol
6-Dec-24	BP	Victoria Sleight Sleight Forum 24
12-Dec-24	DR	TOTAL CHARGES TO 20NOV2024
23-Dec-24	BP	Imogen Cavadino Annual Award 24

	Opening balance:		**£98,817.65**
Reference file(s)	Paid Out	Paid In	Balance
		45.00	
		45.00	
		45.00	
		45.00	
		45.00	
		45.00	
		45.00	
		45.00	
		45.00	
		45.00	99267.65
		2.40	99270.05
		45.00	
		92.85	99407.90
		67.76	99475.66
		24.42	99500.08
	11.00		
		287.46	99776.54
		268.99	100045.53
		88.24	100133.77
		87.46	100221.23
		24.42	100245.65
		68.54	100314.19
		44.12	100358.31
		23.99	100382.30
		87.46	100469.76
001 receipt and payment note	24.60		
002 receipt and payment note	94.20		
003 receipt and payment note	141.50		
004 receipt and payment note	298.00		
005 receipt and payment note	887.00		
006 receipt and payment note	300.00		
ENT CHARGE	17.00		98707.46
		45.00	
		131.46	98883.92
		88.24	98972.16
		67.33	99039.49
		23.99	99063.48
		24.42	99087.90
		0.60	99088.50
	11.00		99077.50
		92.96	99170.46

		131.91	99302.37
		44.12	99346.49
		584.36	99930.85
007 receipt and payment note	100.80		99830.05
		0.60	99830.65
		44.12	
008 receipt and payment note	322.51		
009 invoice and payment note	2034.00		
010 receipt and payment note	239.12		97279.14
011 receipt and payment note	630.38		
NT CHARGE	0.24		
		88.24	96736.76
	11.00		96725.76
		4.20	96729.96
		44.12	
012 receipt and payment note	366.89		
013 receipt and payment note	447.67		
HARGE	17.00		95942.52
		24.50	95967.02
	11.00		95956.02
		43.34	95999.36
	11.00		95988.36
		24.42	96012.78
014 receipt and payment note	1308.00		94704.78
		642.79	95347.57
		16.20	95363.77
	11.00		
		24.17	95376.94
		43.94	95420.88
		44.12	95465.00
		5.40	95470.40
015 receipt and payment note	1500.00		
GE	17.00		
016 receipt and payment note	125.80		
017 receipt and payment note	1500.00		
HARGE	17.00		
018 receipt and payment note	1365.00		
CHARGE	17.00		
019 receipt and payment note	300.00		
NT CHARGE	17.00		
020 receipt and payment note	86.85		90524.75
nk PLC SCS 0000001.25322484 /TMS/ / MS/202	11.97		90512.78
	11.00		90501.78
		43.67	90545.45
021 receipt and payment note	159.04		

022 receipt and payment note	500.00		
023 receipt and payment note	1500.00		
HARGE	17.00		
024 receipt and payment note	1500.00		
025 receipt and payment note	1500.00		
ENT CHARGE	17.00		85352.41
		3.00	85355.41
PLC SCS	13.78		85341.63
	11.00		85330.63
		42399.00	127729.63
		742.97	128472.6
	11.00		128461.6
026 receipt and payment note	887.00		127574.6
027 receipt and payment note	1500.00		
JT CHARGE	17.00		126057.6
	11.00		126046.6
028 receipt and payment note	1500.00		
CHARGE	0.24		124546.36
Bank PLC SCS	13.34		124533.02
		43.34	124576.36
	11.00		
029 receipt and payment note	98.45		124466.91
030 invoice and payment note	3192.00		121274.91
		43.34	121318.25
031 receipt and payment note	1510.00		
032 receipt and payment note	205.60		
033 receipt and payment note	282.70		
034 receipt and payment note	169.74		119150.21
035 receipt and payment note	471.00		
NT CHARGE	0.24		
036 receipt and payment note	133.99		
037 receipt and payment note	59.40		
		667.84	119153.42
038 receipt and payment note	279.61		118873.81
	11.00		118862.81
039 receipt and payment note	500.00		118362.81
	Closing balance:		**£118,362.81**
	Total exp.	Total inc.	
	28345.66	**47890.82**	

INCOME				
subscriptions	subscriptions (Stripe)	profit share (JMS)	payments from COIF funds	book sales
45.00				
45.00				
45.00				
45.00				
45.00				
45.00				
45.00				
45.00				
45.00				
45.00				
				2.40
45.00				
	92.85			
	67.76			
	24.42			
	287.46			
	268.99			
	88.24			
	87.46			
	24.42			
	68.54			
	44.12			
	23.99			
	87.46			
45.00				
	131.46			
	88.24			
	67.33			
	23.99			
	24.42			
				0.60
	92.96			

131.91
44.12
584.36
0.60
44.12
88.24
4.20
44.12
24.50
43.34
24.42
642.79
16.20
24.17
43.94
44.12
5.40
43.67

				3.00
		42399.00		
			742.97	
	43.34			
	43.34			
			667.84	
540.00	2281.46	42399.00	2637.96	32.40

			EXPENDITURE	
Bank charges	Payment charges	Council travel exes	JMS editorial stipend	Malacologist
11.00				
		24.60		
		94.20		
		141.50		
			887.00	
	17.00			
11.00				

322.51

239.12

0.24

11.00

17.00

11.00

11.00

11.00

17.00

125.80

17.00

17.00

17.00

86.85

11.97

11.00

159.04

	17.00			
	17.00			
	13.78			
11.00				
11.00				
			887.00	
	17.00			
11.00				
	0.24			
	13.34			
11.00				
		98.45		
		205.60		
		282.70		
		471.00		
		0.24		
		133.99		
		59.40		
		279.61		
11.00				
132.00	192.57	2565.57	1774.00	159.04

Travel Awards	Other Awards	Forum Travel	AGM/Forum Cat€	Admin (accounts)
298.00				
300.00				

100.80

2034.00

630.38

366.89
447.67

1308.00

1500.00

1500.00

1365.00

300.00

500.00				
	1500.00			
	1500.00			
	1500.00			
	1500.00			
	1500.00			
			3192.00	
		1510.00		
			169.74	
	500.00			
2842.94	12365.00	1510.00	5496.54	1308.00

CHARITY COMMISSION FOR ENGLAND AND WALES

Independent examiner's report on the accounts

Section A Independent Examiner's Report

Report to the trustees	Charity Name Malacological Society of London		
On accounts for the year ended	31/12/2024	**Charity no (if any)**	275980
Set out on pages	(remember to include the page numbers of additional sheets)		

I report to the trustees on my examination of the accounts of the above charity ("the Trust") for the year ended 31/12/2024.

Responsibilities and basis of report

As the charity's trustees, you are responsible for the preparation of the accounts in accordance with the requirements of the Charities Act 2011 ("the Act").

I report in respect of my examination of the Trust's accounts carried out under section 145 of the 2011 Act and in carrying out my examination, I have followed all the applicable Directions given by the Charity Commission under section 145(5)(b) of the Act.

Independent examiner's statement

I have completed my examination. I confirm that no material matters have come to my attention in connection with the examination which gives me cause to believe that in, any material respect:

- the accounting records were not kept in accordance with section 130 of the Charities Act; or
- the accounts did not accord with the accounting records; or
- the accounts did not comply with the applicable requirements concerning the form and content of accounts set out in the Charities (Accounts and Reports) Regulations 2008 other than any requirement that the accounts give a 'true and fair' view which is not a matter considered as part of an independent examination.

I have no concerns and have come across no other matters in connection with the examination to which attention should be drawn in this report in order to enable a proper understanding of the accounts to be reached.

Signed:		**Date:**	31/10/2025
Name:	Richard Stone		
Relevant professional qualification(s) or body (if any):	FCCA		
Address:	35A Whitehill Road Cambridge CB5 8LU		

THE MALACOLOGICAL SOCIETY OF LONDON

England & Wales - Charity number 275980

Accounts

REGISTERED CHARITY NUMBER: 275980

REPORT OF THE TRUSTEES AND UNAUDITED FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2023 FOR THE MALACOLOGICAL SOCIETY OF LONDON

Staffords
Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
Oakington Road, Girton
CAMBRIDGE
Cambridgeshire
CB3 0QH

THE MALACOLOGICAL SOCIETY OF LONDON

CONTENTS OF THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2023

THE MALACOLOGICAL SOCIETY OF LONDON

REPORT OF THE TRUSTEES

FOR THE YEAR ENDED 31 DECEMBER 2023

The trustees present their report with the financial statements of the charity for the year ended 31 December 2023. The trustees have adopted the provisions of the Charities SORP (FRS102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

STRUCTURE, GOVERNANCE AND MANAGEMENT

Governing document

The charity is controlled by its governing document, a deed of trust, and constitutes an unincorporated charity.

The governing document is continually reviewed following its original adoption on 17 May 1978, with the current operative revision of the governing document being that amended on 28 April 2005.

Recruitment and appointment of new trustees

Nominations for Council (the board of related party) from members must be proposed and seconded and in the hands of the Secretary by December 31st. Members at the AGM 2016 proposed and seconded that only the Society's President and Officers (Treasurer, Secretary, Membership Secretary, Awards Secretary) are forming the board of trustees. It shall be the duty of Council to nominate members for election to the offices of President, Treasurer, Secretary, Membership Secretary, Editor of the Journal, Editor of the Bulletin, Archivist, Web Manager, and Awards Secretary, and for the vacancies in the Council caused by annual retirement. Nominations from the members and from Council shall be submitted to the Society with the notice convening the Annual General Meeting which shall be sent to every member of the Society not less than fourteen days before the Meeting.

In the case of a vacancy arising in any office of the Society, or in the Council, other than by way of resignation or retirement in the Annual General Meeting, the Council shall have power to appoint a temporary Council member to that vacancy until the next Annual General Meeting.

Risk management

The trustees have a duty to identify and review the risks to which the charity is exposed and to ensure appropriate controls are in place to provide reasonable assurance against fraud and error.

In particular:

(a) Admission fees and annual subscriptions shall be such sums as may be determined by a Special General Meeting convened under Rule VI(c), or at the Annual General Meeting.

(b) Subscriptions shall be due on the 1st of January in each year; but in the case of a new member, immediately after election. Members elected during the months of November and December, however, shall not be required to pay for the year in which they are elected.

(c) Any member whose current subscription has not been received in full by 31 January shall be reminded of the arrears in subscription and be informed that despatch of the Journal is suspended until the arrears are paid. No member whose subscription is twelve months in arrears shall be entitled to any of the privileges of the Society, and any member whose subscription is two years in arrears shall cease to be a member of the Society, unless the Council decide otherwise.

(d) The Council shall revise and publicise the conditions of the Society's awards and grants from time to time.

(e) For the purpose of legal protection of the property of the Society, all funds, books and other property shall be declared vested in Council as the Society's Trustees.

(f) The Council shall cause to be kept Minutes of Council and Society Meetings and books of account in respect of all receipts, payments, assets and liabilities. Accounts shall be presented to each Annual General Meeting for approval by members and such accounts shall be audited or independently examined as appropriate.

OBJECTIVES AND ACTIVITIES

Objectives and aims

The governing document contains the following in relation to the objective of the charity:

The objects of the Society are to advance education, research and learning for the public benefit in the study of molluscs from both pure and applied aspects. In furtherance of these objects, but not further or otherwise, the Society shall have the following powers:

(a) To promote and co-ordinate meetings and symposia,

(b) To promote and co-ordinate research both pure and applied;

(c) To provide for the worldwide dissemination of the useful results of such research by publication of the Journal of Molluscan Studies;

(d) To award prizes to outstanding students in the field of molluscan biology;

(e) To award research grants to individuals which will advance the study of molluscan biology;

(f) To do all such things as will further the objects of the Society.

Significant activities

In 2023 the Malacological Society of London held an in-person AGM meeting with the hybrid symposium "William Benson and the golden age of malacology in India", and the annual Molluscan Forum for Young Scientists was also held as a hybrid meeting with in-person and online presentations. The Society published the members' bulletin "The Malacologist" and in cooperation with Oxford University Press "Journal of Molluscan Studies".

Public benefit

The charity's objects are for the public benefit because increasing public knowledge is required as they form an important part of the global biodiversity and ecosystem stability which can have effects on human health and are a human food source.

ACHIEVEMENT AND PERFORMANCE

Charitable activities

In 2023 the main charitable activities were the funding of nine ECR and two SCR research projects, of which all were claimed, (total cost of £15,812), the support of eighteen students to attend conferences and ten students to attend the Molluscan Forum (£7807), and support to the organization of three malacological conferences (£4,965), as well as covering printing costs of a book on Benson's malacological biodiversity work in Asia (£6,727).

FINANCIAL REVIEW

The finances of the Malacological Society have been pleasing during 2023 with an overall gain of £42,372. This gain is explained by a gain in the Fixed Interest and Investment funds and despite significantly higher awards and meeting expenditure compared to 2022.

The total funds of the Malacological Society are £528,256, of which £101,033 are in cash deposits and £440,531 in unrestricted funds.

Separately, the profit-share from the publication of the Journal of Molluscan Studies in 2023 provided the Society with most of its income contributing £44,092, compared to £43,431 in 2022. This year OUP provided information on sales of the digital archives (£1,119). The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal.

In 2023, significantly more funds were spent on travel and meeting related spending, being £9,815 / £8,577 in 2023 compared to £2840 / £6423 in 2022, while spending for research awards, (£15,812) adjusted to pre-pandemic levels. The Society (MSL) spent more money in 2023 compared to 2022, this was mainly based on more expenses paid for research, travel and meeting awards, as well as the Benson book.

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2023

REFERENCE AND ADMINISTRATIVE DETAILS

Registered Charity number
275980

Principal address
c/o British Antarctic Survey
High Cross
Madingley Road
CAMBRIDGE
CB3 0ET

Trustees

J Ablett	President
Dr H Wood	Membership Secretary
Dr K Linse	Hon. Treasurer
Dr Debbie Wall Palmer	Hon. Secretary
Dr Lauren Sumner Rooney	Awards Officer

Independent examiner
Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Approved by order of the board of trustees on 12. June 2024 and signed on its behalf by:

.....
Jonathan Ablett - Trustee

INDEPENDENT EXAMINER'S REPORT TO THE TRUSTEES OF THE MALACOLOGICAL SOCIETY OF LONDON

I report on the accounts for the year ended 31 December 2023 set out on pages five to ten.

Respective responsibilities of trustees and examiner
The charity's trustees are responsible for the preparation of the accounts. The charity's trustees consider that an audit is not required for this year (under Section 144(2) of the Charities Act 2011 (the 2011 Act)) and that an independent examination is required.

It is my responsibility to:

- examine the accounts under Section 145 of the 2011 Act
- to follow the procedures laid down in the General Directions given by the Charity Commission (under Section 145(5)(b) of the 2011 Act); and
- to state whether particular matters have come to my attention.

Basis of the independent examiner's report
My examination was carried out in accordance with the General Directions given by the Charity Commission. An examination includes a review of the accounting records kept by the charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and seeking explanations from you as trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit, and consequently no opinion is given as to whether the accounts present a 'true and fair view ' and the report is limited to those matters set out in the statements below.

Independent examiner's statement
In connection with my examination, no matter has come to my attention:

(1) which gives me reasonable cause to believe that, in any material respect, the requirements

- to keep accounting records in accordance with Section 130 of the 2011 Act; and
- to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the 2011 Act

have not been met; or

(2) to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Date: 30/05/2024

The Malacological Society of London

Statement of Financial acitivities (incorporating an income and expenditure account) for the year ended 31st December 2023

Note		TOTAL 2023	TOTAL 2022
	INCOMING RESOURCES		
	Income from Activities of the Charity		
	Members' Subscriptions: Current Year	3,010	3,035
	Collection of Subscription Arrears	-	-
4	OUP: Income from Journal Publication	44,092	43,431
2	Income from sale of Digital Archive	1,119	-
	Sundry Income	68	33
	Donations	-	-
	Income from Investments		
3	Interest	93	21
3	Dividends	2,337	2,813
	TOTAL INCOMING RESOURCES	**50,720**	**49,333**
	RESOURCES USED		
	Awards		
	Annual Award	500	500
	WCM Award	-	200
7	Research Awards (Early career & Senior)	15,812	17,534
	Malacological meeting awards	4,965	3,523
		-	-
7	Travel Bursaries for conferences	7,807	1,500
5,6	Travel awards: AGM	368	-
5,6	Travel awards: Forum	1,640	1,340
		31,092	**24,597**
	Directly Relating to Work of Charity		
4	Journal expenses (member fees)	2,146	2,492
4	Journal colour plates	-	-
4	Journal editor expenses, incl meetings	1,722	2,100
5	Malacologist Expenses	577	-
6	Meeting Expenses	3,612	2,900
	Independent examiners expenses	1,308	1,248
5,6	Council Meeting travel expenses	2,059	617
	Web sites	1,549	560
5	Postage, Printing & Stationary		
	Charges for cc subscription collection	59	58
	Bank charges	563	404
	Sundries	6,727	748
	Total	**51,414**	**35,723**
	NET INCOME	**- 694**	**13,610**
8	LOSS/GAIN ON REVALUATION OF FIXED ASSETS	42,372	- 43,663
	NET MOVEMENT IN FUNDS	41,679	- 30,052
	TOTAL FUNDS BROUGHT FORWARD	486,577	516,629
	TOTAL FUNDS CARRIED FORWARD	**528,256**	**486,577**

CONTINUING OPERATIONS
All income and expenditure has arisen from continuing activities.

The Malacological Society of London

Balance Sheet at 31 December 2023

Note		2023	2022
		£	£
	FIXED ASSETS	**440,531**	**398,158**
8	Tangible Assets		
	CURRENT ASSESTS		
11	Debtor	-	-
9	Cash at Banks	101,033	101,667
10	CREDITORS: (Amounts falling due within one year)	- 13,308	- 13,248
	NET CURRENT ASSETS	**87,725**	**88,419**
	TOTAL NET ASSETS	**528,256**	**486,577**
	FUNDS		
	Unrestricted (Designated):		
11	Annual Award Fund	6,500	6,500
11	CM Yonge Award Fund	9,250	9,250
11	Centenary Research Award Fund	80,000	80,000
		95,750	95,750
11	General reserve Fund	432,506	390,827
	TOTAL FUNDS	**528,256**	**486,577**

Katrin Linse
Honorary Treasurer & Trustee

Dated 12/6/2024

Katrin Linse

Jonathan Ablett
President & Trustee

Dated 12/6/2024

JAblett

The Malacological Society of London

Notes to the Financial Statements for the year ended 31st December 2023

1. ACCOUNTING POLICIES

Basis of Preparing the Financial Statements

The financial statements have been prepared in accordance with the Charities SORP (FRS 102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

- The SORP normally requires a columnar fomat, in this entities case the trustees' view is this is not appropriate as there are neither restricted funds nor endowment funds and so all of the activity in the year would fall within the unrestricted fund column.

Accounting Convention

The financial statements have been preprared under the historical cost convention, except for those items described immediately below.

- The historic cost basis of accounting is used except for investments, which have been included at their market value where readily available at the yearend date.

Going concern

The Trustees consider that there are no material uncertainties about the charity's ability to continue as a going concern.

Reconciliation with previously Generally Accepted Accounting Practice

In preparing the accounts, the trustees have considered whether in applying the accounting policies required by FRS102 and the Charities SORP FRS 102 the reinstatement of comparative items was required. In the case of this charity, no changes were made.

Fund accounting

- The Society funds, including funds available for awards, are not subject to any restrictions regarding their use, and are available to be used for the general purposes of the Charity. Consequently they are classified as 'Designated Funds'.

Taxation

- The charity is exempt from tax on its charitable activities.

Significant judgements

Apart from those judgements involving estimations, the management has not made any judgements in the process of applying the entity's accounting policies that have significant effect on the amounts recognised in the accounts. There are no key assumptions concerning the future or other key sources or estimation uncertainty at the reporting date that have significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next reporting period.

Financial reporting standard 102 - reduced disclosure exemption

The charity has taken advantage of the following disclosure exemption in preparing these financial statements, as permitted by FRS 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland':

- the requirements of Section 7 Statement of Cash Flows

Resources Expended

The Malacological Society of London

Notes to the Financial Statements for the year ended 31st December 2023

Expenditure is accounted for on an accruals basis and has been classified under headings that aggregate all cost related to the category. Where costs cannot be directly attributed to particular headings they have been allocated to activities on a basis consistent with the use of resources.

Incoming Resources
All income is recognised in the Statement of Financial Activities once the charity has entitlement to the funds, it is probable that the income will be received and the amount can be measured reliably.

Foreign currencies
- Asessts and liabilities in foreign currencies are translated into sterling at the rates of exchange ruling at the balance sheet date. Transactions in foreign currencies are tranlated into sterling at the rates of exchange ruling at the date of transaction. Exchange differences are taken into account in arriving at the operating result.

Incoming Resources and Resources used
· Subscriptions for annual membership are treated as follows:

Pre-paid in prior year	Liabilities
Paid in current year	Incoming Resource: subscriptions
Unpaid at 31st December	Not included in accounts. No debtor
Subsequently recieved	Incoming Resource: collection of subscriptions in arrears

· The costs of the Society Journal and supplements are written off in the year of initial distribution.
· The Profit Share from Oxford Journals is included in the year of receipt and not accrued.
The amount of Profit Share cannot be determined accurately by OUP until after the Society's AGM.

2. SALE OF THE DIGITAL ARCHIVE BY OUP
Since 2010 the sale of the digital archives by OUP has generated a windfall profit of £13,969 in 2010, £9,284 in 2011, £7,299 in 2012, £10,068 in 2013, £7,827 in 2014, £10,590 in 2015, £2,805 in 2016, £10,429 in 2017, £4,238 in 2018, £1,352 in 2019, £506 in 2020 and £1,119 in 2023.

3. INTERESTS & DIVIDENDS
Income has been derived from the following sources and has been applied to funds as indicated:

		2023 £	2022 £
Sources	COIF Deposit Fund Interest	-	-
	COIF Fixed Interest Fund Dividend	2,337	2,813
	COIF Investment Fund Dividend		
		2,337	**2,813**
Beneficiary	Revenue Fund	742	893
	Annual Award Fund	122	147
	CM Yonge Award Fund	172	207
	Research Grants other Funds	1,301	1,566
		2,337	**2,813**

4. JOURNAL The surplus resulting from publication of the Journal is as follows

	2023 £	2022 £
Profit Share from OUP	45,211	43,431
Less: sales of digital archives	- 1,119	-

Profit Share from OUP re Journal	**44,092**	**43,431**
Less:printing costs provisioning	- 12,000	- 12,000
plates	-	-
Editor & CM meeting expenses	- 1,722	- 2,100
Under/over-provision in previous year	**9,854**	**9,508**
Surplus on publication of the Journal	**40,224**	**38,839**

5. RELATED PARTY TRANSACTIONS AND TRUSTEES' EXPENSES

No Trustee or Council Member has recieved any renumeration during the current or previous year. Expenses paid by Trustees and Council Members on behalf of the Society have been reimbursed during the current year as follows.

Trustee	Date	£	Reason
Ablett	11.01.23	135.48	Forum reception
Hodgson	18.01.23	113.15	CM travel
Sleight	18.01.23	214.23	CM travel
Whittle	18.01.23	53.70	CM travel
Grahame	13.02.23	322.60	CM travel
Grahame	13.02.23	89.00	CM travel
Wood	13.02.23	111.99	CM travel
Raheem	13.02.23	861.00	JMS edit support
Wood	14.03.23	116.49	CM travel
Linse	30.03.23	62	CM travel
Linse	30.03.23	367.95	AGM dinner
Hodgson	30.03.23	105.90	CM travel
Whittle	30.03.23	40.00	CM travel
Cameron	30.03.23	51.30	CM travel
Fenberg	30.03.23	30.40	CM travel
Ablett	30.03.23	56.67	AGM reception
Grahame	17.07.23	120.85	CM travel
Raheem	17.07.23	861.00	JMS edit support
Linse	17.07.23	30.40	CM travel
Raheem	21.07.23	1,400.00	Snail ID workshop
Dussart	25.09.23	140.46	Malacologist 2022
Dussart	25.09.23	157.20	Malacologist 2023
Dussart	25.09.23	120.87	Malacologist 2020
Dussart	06.11.23	158.39	Malacologist 2023
Ablett	14.11.23	141.31	Forum reception 2023
Hollyman	14.11.23	1,640.00	Forum Travel awards
Linse	27.11.23	56.90	CM travel
Whittle	27.11.23	56.90	CM travel
Cameron	27.11.23	60.75	CM travel
Goulding	27.11.23	269.47	CM travel
Grahame	07.12.23	153.20	CM travel

6. MEETING EXPENSES

The following costs have been incurred on meetings for the Society:

		2023 £	2022 £
AGM:	Speakers travel	368	-

	General	139	-
	Dinner	368	-
	Zoom	-	91
Forum:	Travel	1,640	1,340
	Reception drinks	276	-
	Zoom	-	226
	Adobe	-	-
	Benugo	2,736	2,809
	Security	92	
Council:	Travel	-	391
	Zoom (Feb/March)	-	-
		5,619	**4,857**

7. GRANTS AND AWARDS TO INSTITUTIONS

Although grants and awards are given to individuals, in many cases those individuals are affiliated with an institution. Under the SORP, the Society is required to give an analysis of the range of institutions for whom grants and awards are paid:

	£	
Early Career Res. Grants:	1,500	NSTRC, Argentina
	1,400	Imperial College, UK
	1,500	Uni Roma, Italy
	1,485	Uni Roma, Italy
	1,334	Uni Abderdeen, UK
	1,500	Uni Southampton, UK
	1,400	Uni La Sapenza, Italy
	1,500	Uni Philippenes, Philippenes
	1,500	Uni Hong Kong, Hong Kong
Senior Research Grants	1,493	Uni Lodz, Poland
	1,200	The Mill House, UK
Total	**15,812**	

In the year the total amount of grants to institutions was £13948.

8. INVESTMENTS

In 2023 no funds were transferred to the COIF Investment fund and to the Fixed Interest Fund.
The following investments are held as at 31st December 2023

	Number of units	Price 31-Dec-23 £	Market Value 31/12/20223 £	Book Value 31-Dec-22 £
COIF Investment Fund (Accumulation Units)	1,364.59	248.0003	338,419	301,164
COIF Fixed Interest Fund	83,479.39	1.2232	102,112	96,995
			440,531	**398,158**

These investments have been valued at market price (£440,531) in the Balance sheet, with appropriate adjustment (£42,372 - £0 transfers) for the increase in their value (£42,372) in the Statement of Financial activities as an unrealised gain.

9. CASH DEPOSITS

The following accounts are held and the balances in each account are:

	2023	2022
	£	£
COIF Deposit	2,216	2,123
HSBC Bank Current Account	98,818	99,544
Total	**101,033**	**101,667**

10. CURRENT ASSESTS & LIABILITIES

The following debtors are outstanding

	2023	2022
	£	£
Forum Travel awards not used	-	-

The following creditors are outstanding:

	2023	2022
	£	£
Society Journal (provision)	12,000	12,000
Accruals	1,308	1,248
	13,308	**13,248**

11. UNRESTRICTED FUNDS

The following movements have taken place within the Society's four designated funds:

	Revenue	Annual Award	CM Yonge Award	Reseach & other Awards	Total
	£	£	£	£	£
Balance: 1st January 2023	**390,827**	**6,500**	**9,250**	**80,000**	**486,577**
Interest Earned	742	122	172	1,301	**2,337**
Grants	-	500	-	15,812	**16,312**
Allocated Surplus: 2023	40,933	378	172	14,515	**55,654**
Balance: 31st December 2023	**432,502**	**6,500**	**9,250**	**80,004**	**528,256**

The Trustees can, by resolution at one of their meetings, re-designate these funds for other purposes.

THE MALACOLOGICAL SOCIETY OF LONDON

England & Wales - Charity number 275980

Accounts

ISSN 1759-1406

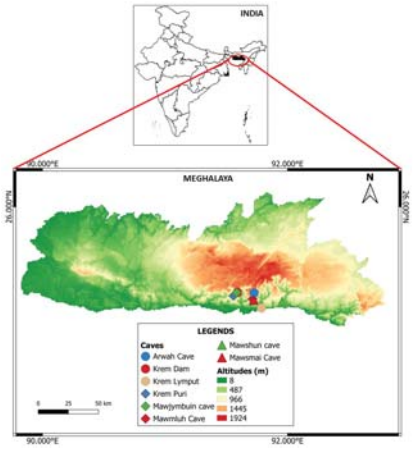
The Malacologist

The Bulletin of The Malacological Society of London

NUMBER 81 AUGUST 2023

Contents

This issue includes a report of the 130th AGM of the Malacological Society of London, plus a report on the special symposium, entitled *"William Benson and the golden age of malacology in India "* co-hosted by the Society and the Natural History Museum



Images from the research grant report by Nipu Kumar Das entitled *Non-marine molluscs of anthropogenically impacted caves of Meghalaya: understanding diversity and threats for conservation.* The report is on page 18 of this issue.

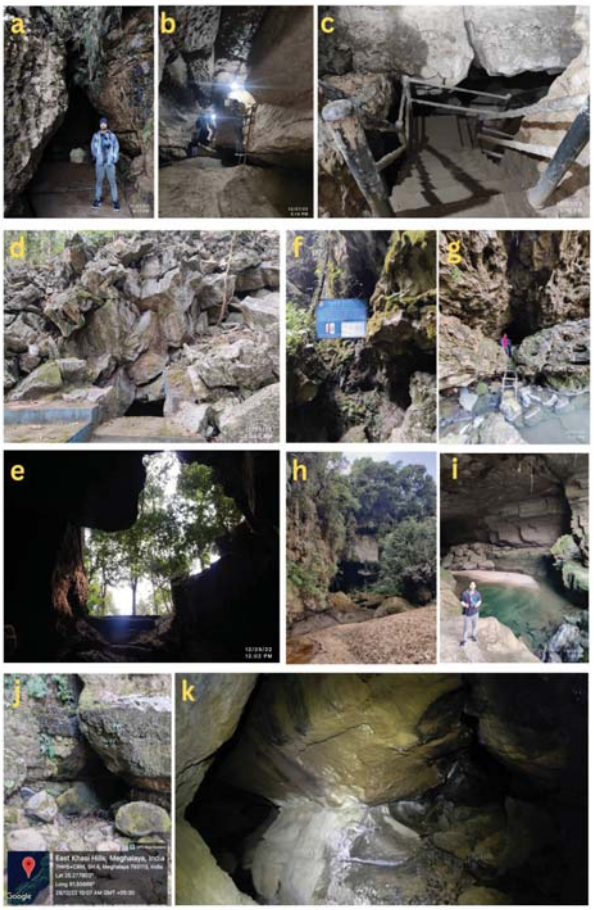


Figure 2: The surveyed limestone caves of Meghalaya:

EDITORIAL

Many malacological research projects have addressed issues of climate change and in times of global warming, having access to past data is vitally important. The Malacological Society of London (MSL) awarded a senior research grant to Louise Firth to further such a project and this issue includes her report entitled "Standing on the shoulders of giants: archiving Rosemary Bowman's historical limpet data" (page 24).

As well as climate change, the other major issue of our time (other than nuclear Armageddon, catastrophically declining biodiversity and death by plastic pollution) is artificial intelligence. It is only a matter of a (probably short) time before the abbreviation is abundant in the pages of *The Malacologist.* Sufficient unto the day the evil thereof. In the mean time, we can cheer ourselves up with molluscs, particularly at the Malacological Forum which takes place in November 2023 and is featured in this issue (pages 6 & 30). If you know any young malacologist, please bring the Forum to their attention. It is a high point of our malacological year. The MSL also supports early career research and Nipu Das presents a report on non-marine molluscs of anthropogenically impacted caves of Meghalaya.

Young malacologists need to travel, and MSL funded travel award reports are also presented in this issue including reports on "Reducing shipworm larval settlement on wood modified by furfurylation" by Lucy Martin, "*Angiostrongylus malaysiensis* in gastropod and rat population at recreational parks of Kuala Lumpur" by Suey Yee Low, "Connectivity patterns of invasive snails *Callinina georgiana* and *Heterogen japonica*" by W.A.N.U Nimanthi Abeyrathna and "Developing a nationwide baseline of giant clam population densities across the coral reefs of Thailand" by Matthias Desmolles.

An obituary on page 17 celebrates the life and work of Maryna Plesoway.

TAXONOMIC/NOMENCLATURAL DISCLAIMER
This publication is not deemed to be valid for taxonomic/nomenclatural purposes [see Article 8b in the International Code of Zoological Nomenclature 3rd Edition (1985), edited by W.D. Ride *et al.*].

Prof. Georges Dussart
Canterbury Christ Church University
Canterbury,
Kent CT1 3JZ
georges.dussart@canterbury.ac.uk

Annual Award of the Malacological Society of London (MLS)

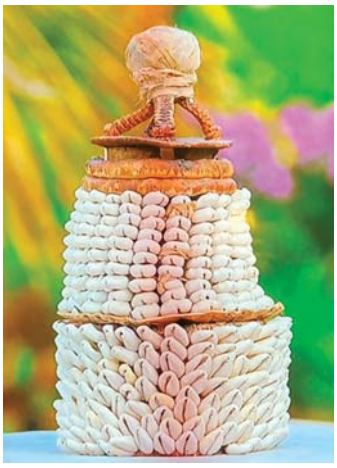
The Malacological Society of London received two nominations for the Annual Award before the new deadline of the 1st December. The winner of the Annual award for 2022 was Alison Irwin for her PhD thesis on the *Evolution and function of vision in strombids.* The reviewers agreed that this multifaceted body of work united the fields of evolutionary and sensory biology, demonstrated a range of skills, and provided new insights to the biology of this fascinating family and their ecology.

Other awards

The Oxford University Press award for the best student poster at the 2023 Malacological Forum went to Margrethe Johansen, School of Life Sciences, University of Nottingham, for her talk 'A high density linkage and binary trait map for shell-colour phenotypes in the grove snail (*Cepaea nemoralis*)'.

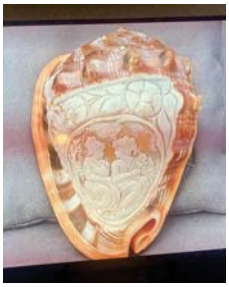
At the World Congress of Malacology 2022, MLS awards went to Lauren Eggleton for her oral presentation and Elisa Nocella for her poster

Molluscs on the Antique Roadshow



African celebratory vase studded with cowrie shells. This item featured on the Antiques

Viewers were challenged as to the value of three items of carving, including a ring and a carved conch shown here. The machine-carved 20th century conch was the least valuable at £100-200.

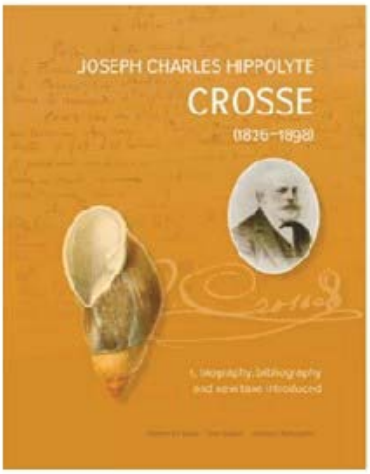


New publication—Joseph Crosse *1826-1898).*

At the end of December 2022 the Royal Belgian Institute of Natural Sciences published the book:-

Joseph Charles Hippolyte Crosse (1826-1898). 1, biography, bibliography and new taxa introduced

Edited by Abraham S. Breure, Cédric Audibert & Jonathan D. Ablett
You can download a PDF of this book for free at: https://jemu.myspecies.info/node/6511#overlay-context=
The password to open the PDF is: Crosse2022
A print-on-demand version (hardcopy) can be purchased at: https://tinyurl.com/mnv538n8
In 2023 two more volumes will be published.
Contact—Thierry Backeljau
Head of the Operational Directorate "Taxonomy and Phylogeny"
Royal Belgian Institute of Natural Sciences
Vautierstraat 29
B-1000 Brussels
Belgium



Joseph Charles Hippolyte Crosse (1826-1898)
Volume 1: biography, bibliography and new taxa
Abraham S.H. Breure, Cédric Audibert, Jonathan D. Ablett.

Available to purchase as hardback or free to download

https://jemu.myspecies.info/node/6511

Bivalve conference in Cambridge is replete

Bivalves - Where Are We Going?

September 5, 2023 to Friday, September 8, 2023, University of Cambridge (UK)

We aim to provide a relaxed, open, in-person meeting. The following information will help you to apply for attendance grants and plan your visit. We expect to launch the website and a full circular by the end of March.

The meeting will start in the afternoon on 5th September with Registration and a Reception in Sedgwick Museum of Earth Sciences. The meeting will close with the Banquet in the main Hall of Gonville & Caius College on the evening of Friday 8th September.

We have finalized the costs and confirm that registration fees will be £110 (students £75). Registration will cover Reception in the Sedgwick Museum, Poster session with refreshments, one lunch and all tea and coffees. The Conference Banquet will be additional at a cost of £80 per head.

Organisers: Liz Harper (University of Cambridge), John Taylor, Emily Glover & Katie Collins (NHM London)
Contact Email: emh21@cam.ac.uk

https:/bivalves.esc.cam.ac.uk

Update 10/07/2023: We have reached capacity, please get in touch with the organisers if you wish to be contacted in the event of places becoming available.

Limpets 2020 (+4)

Biology of Limpets: evolution, adaptation, ecology and environmental impacts

(Meeting of the Malacological Society of London)

First Announcement
Date of Meeting – 5th & 6th March 2024

Venue: Natural History Museum, London

Meeting Organisers
Dr Phillip Fenberg (University of Southampton), Prof Steve Hawkins (Plymouth MBA), Dr Louise Firth (University of Plymouth/University College, Cork), Prof Alan Hodgson (Rhodes University), Mr Jon Ablett (NHM, London)

In 2020 plans to hold a 3-day meeting providing a forum to discuss recent findings on all aspects of limpet biology was cancelled due to the covid-19 pandemic. Now that in person meetings are happening, we would like to announce a 1.5 day conference in early 2024 on all things limpet. It is hoped that a scaled-down meeting will still stimulate more research on these ecologically important molluscs. A number of key-note speakers are being approached (names to be announced later this year) and sessions will be available for contributed papers and posters. Presentations of research in which limpets (marine and freshwater, living and extinct) have been used as model animals in evolutionary, adaptational (morphology, physiology, reproductive biology, behaviour), ecological, environmental and climate studies are especially encouraged.

Meeting duration – 1.5 days with no parallel sessions
(**Note**: meeting will commence with talks and an informal social gathering on the afternoon/evening of the 5th March)
Registration Fee – FREE
During the meeting the Malacological Society will also hold its AGM

To help plan the meeting, **e-mail your expression of interest** to Alan Hodgson (A.Hodgson@ru.ac.za) indicating type of presentation you would prefer (platform paper or poster) and possible topic.

Details about registration, deadlines, and outline programme will be announced later in 2023 as plans for the meeting take shape.

NATURAL HISTORY MUSEUM

World's first octopus farm—from a BBC report

A plan to build the world's first octopus farm has raised deep concerns among scientists over the welfare of the famously intelligent creatures. The farm in Spain's Canary Islands would raise about a million octopuses annually for food, according to confidential documents seen by the BBC. They have never been intensively farmed and some scientists call the proposed icy water slaughtering method "cruel." The Spanish multinational behind the plans denies the octopuses will suffer. The confidential planning proposal documents from the company, Nueva Pescanova, were given to the BBC by the campaign organisation Eurogroup for Animals.

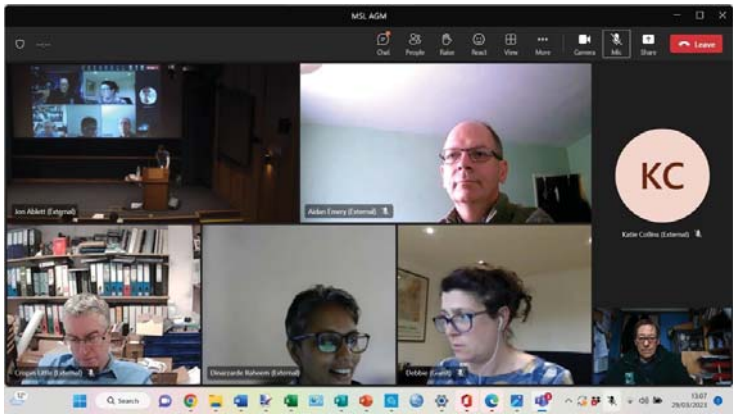
Nueva Pescanova sent the proposal to the Canary Islands' General Directorate of Fishing, Octopuses caught in the wild using pots, lines and traps are eaten all over the world, including in the Mediterranean and in Asia and Latin America. Research in to breeding them in captivity has been going on for decades. Nueva Pescanova announced in 2019 that it had made a scientific breakthrough.

The prospect of intensively farming octopus has already led to opposition: Lawmakers in the US state of Washington have proposed banning the practice before it even starts. Nueva Pescanova's plans reveal that the octopuses would be kept in tanks with other octopuses, at times under constant light. The creatures - the species *Octopus vulgaris* - would be housed in around 1,000 communal tanks in a two-storey building in the port of Las Palmas in Gran Canaria. They would be killed by being put in containers of water kept at -3ºC. Currently there are no welfare rules, as octopuses have never been commercially farmed before. However studies have shown that this method of slaughtering fish using 'ice slurry' causes a slow, stressful death. The World Organisation for Animal Health says it "results in poor fish welfare" and the Aquaculture Stewardship Council (ASC) - the leading farmed seafood certification scheme - is proposing a ban unless specimens are stunned beforehand.

Some supermarkets have already moved away from selling fish that have been killed using ice, including Tesco and Morrisons. Prof. Peter Tse, a cognitive neuroscientist at Dartmouth University, told the BBC that "to kill them with ice would be a slow death ... it would be very cruel and should not be allowed." The global octopus trade is now estimated to be worth more than £2.2bn. To supply "premium international markets" including the US, South Korea and Japan, Nueva Pescanova wants to produce 3,000 tonnes of octopus a year. This equates to around one million animals, with some 10-15 octopuses living in each cubic metre of tank, according to campaign group Compassion in World Farming (CiWF). Nueva Pescanova estimates there will be "a mortality rate of 10-15%".

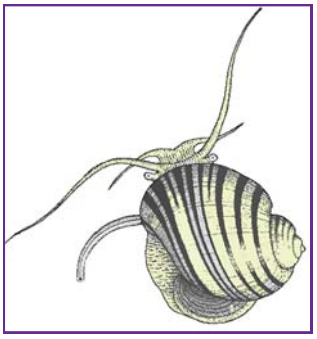
IMAGE SOURCE,GERARDO G. MOURÍN -

Some members of the Council of the Malacological Society of London attending a Zoom Council meeting



The Malacological Society of London

HTTP://WWW.MALACSOC.ORG.UK



Molluscan Forum

Thursday 16th November 2023
9:00 am – 6.30 pm
Flett Lecture Theatre
Natural History Museum, London

CALL FOR REGISTRATIONS AND PAPERS

See page 30 in this issue for more details

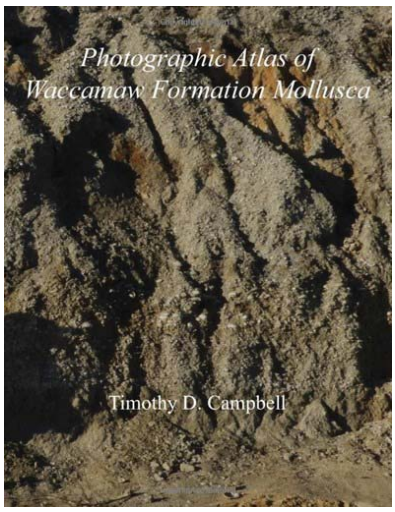
Front page news

Slugs make it to the front page of the Daily Star
(it is the silly season, after all)

Photographic Atlas of Waccamaw Formation Mollusca

Paperback – July 26, 2023
by Timothy David Campbell

This book provides a photographic guide to over 1100 species of mollusks from the basal Pleistocene Waccamaw Formation of southeastern North Carolina and Northeastern South Carolina. It expands the set of molluscan species well-documented from the formation from ~650 to ~1250, and reveals a much more complex fauna than previously known, including numerous endemics, genera not previously reported from the western north Atlantic, and numerous temporal range extensions. In addition to just over 3000 black-and-white photographs, it contains 16 identification keys, a glossary, an appendix of additional accurate records not figured, and an appendix of taxonomic notes. This contains the highest number of species and photographs of mollusks of any reference on a single formation in the southeastern United States. In addition to its focus, *A Photographic Atlas of Waccamaw Formation Mollusca* should prove a useful reference



Annual report of Malacological Society Council for 2022/2023

delivered by the President, Dr Jon Ablett

The 130th Annual General Meeting of the Malacological Society of London took place on Wednesday the 29th March from 12:30 to 13:30 in person in the Flett Theatre of the Natural History Museum, London, as part of the '*William Benson and the golden age of malacology in India* symposium'. The meeting was also accessible remotely via Teams,

Membership reported by Harriet Wood

At the close of 2022 the Malacological Society of London had 74 members, of which 17 were new to the Society. There were 56 ordinary members, 15 student members & 3 honorary members (including the journal Editor). Two long standing members of the Society left at the end of 2022, including Elizabeth Andrews who sadly died on 5th Jan 2023.

For 2023, we currently stand at 85 members, of which 30 are students. The significant student increase is partly due to the Broadening Access Membership Scheme through which 7 students were awarded membership. In addition, there were 2 student prizes awarded at the World Congress of Malacology and the annual Oxford Prize at the Molluscan Forum, all including membership to the Society.

The Broadening Access Membership Scheme was launched in November 2022 to support more postgraduate students, from countries listed as developing economies, in their malacological studies. It offers free membership for 3 years to 10 postgraduate students each year and there are still 3 awards available for 2023 (Broadening Access Membership Scheme - The Malacological Society of London (malacsoc.org.uk)).

We are now in full alignment with Oxford University Press (OUP) regarding our membership list and members' online access to the journal. They have also been able to resolve all known web access issues for our members. With the assistance of OUP we have, where possible, managed to send missing journal issues to the affected members and OUP continue to work with our web developer to set up 'member level referral access' between the MSL and OUP websites.

Many thanks for supporting the Society through your membership.

Finance for the financial year ending 31st December 2022 reported by Katrin Linse

The finances of the Malacological Society have been impacted during 2022 by UK's challenging economy and stock market, with an overall loss of £30,052. This loss is explained by significant losses in the Investment funds. The total funds of the Malacological Society are £486,577, of which £101,667 are in cash deposits and £398,158 in unrestricted funds.

Our investments had an overall loss of £43,663 (comparing market value at 31 December 2022 with market value at 31 December 2021), with the COIF Investment Fund making a loss of £29,780 and the COIF Fixed Interest Fund a loss of £13,883. During 2022, no funds were transferred from the current account to savings accounts.

In 2022 the main charitable activities were the funding of ten ECR and two SCR research projects, of which all were claimed, (total cost of £17,534), the support of three students to attend conferences and eleven students to attend the Molluscan Forum (£2,840), and support to the organization of two malacological conferences (£3,522).

Separately, the profit-share from the publication of the *Journal of Molluscan Studies* in 2022 provided the Society with most of its income contributing £43,431, compared to £48,035 in 2021. This year OUP did not provide information on sales of the digital archives. The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal.

In 2022, more funds were used for research awards, being £17,534 in 2022 compared with £13,948 in 2021 Spending on travel and meeting related spending, which significantly dropped during the pandemic, increased to pre-pandemic levels. The Society (MSL) spent more money in 2022 compared to 2021, based mainly on more expenses paid for research, travel and meeting awards.

Meeting - the Molluscan Forum, reported on by Phil Hollyman and Thomas Goulding

The annual Molluscan Forum was held on the 17th of November 2022. This year, we were able to return to an in-person meeting. In order to increase accessibility, however, we offered a hybrid format to allow for talks and attendance for those unable to be there in person. Over 96 people registered in advance for the event.

This year in addition to the traditional Poster sessions, we again used Quick-fire talks, where each speaker had five minutes and two slides to present their findings. Overall, there were 35 applications for Full and Quick-fire talks and 12 applications for Posters which were presented during 2 virtual, 2 full talk, and 2 Quick fire sessions with posters on display throughout the day. The Oxford prize, awarded annually for the best early career talk, was given to Margrethe Johansen, School of Life Sciences, University of Nottingham, for her talk 'A high density linkage and binary trait map for shell-colour phenotypes in the grove snail (*Cepaea nemoralis*)'

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Publications

***The Malacologist* , reported on by Georges Dussart**

The Malacologist is the on-line bulletin of the Malacological Society of London (MSL). The editorial policy is to publish research grant reports, travel grant reports, obituaries and abstracts of conferences and symposia to show the support given by the Society to malacology and malacologists. The Malacologist offers an eclectic mix of malacological news, emphasising coloured images as well as text in its format. Although it is issued on-line, a limited number of paper copies are produced for various libraries worldwide, including the British Library. The 24 pages of Issue **79** came out on time and, as usual, contained a copy of the President's report of Council and abstracts of the conference which accompanied the AGM; in 2022, the conference was on Molluscan Tropical Biodiversity. It also included a Senior Research Grant report from Abraham Breure entitled *Towards an annotated and illustrated checklist of Peruvian land snails: a visit to Berlin* and reviews of three books including *A Guide to Land Snails of Australia* by Stanisic, J., Potter, D. & Stanisic, J. , *The Sound Of The Sea* by Cynthia Barnett and *Interesting Shells* by Andreia Salvador. Issue **80** (February) came out on time and comprised 35 pages. This issue featured the report of the Malacological Forum of November 2022, thereby including 37 abstracts from 24 countries. There was also a research report from Dr Jose Fernández-Simón in Spain (*Barcoding the diversity of neglected meiofaunal molluscs in the western Mediterranean*), a malacological obituary from Dr. Joris M. Koene in the Netherlands (for Prof Ronald Chase in the USA) and an invited article on *The deep-sea Scaly Footed Snail* from Dr Chong Chen in Japan. Since changes to the rules of the MSL had been proposed by the Council, to be ratified at the 2023 AGM, issue 80 included a copy of the new proposed rules. The Malacologist continues to be an important medium by which the Council communicates with the membership, keeping them and the wider world up-to-date on developments relating to both malacology and the interests of the MSL.

***The Journal of Molluscan Studies,* reported on by Dinarzarde Raheem**

The ISI impact factor for the Journal in 2021 increased to 1.631 (compared with 1.348 in 2020, 1.461 in 2019, 1.345 in 2018 and 1.483 in 2017). The Journal stands at number 82 in the ISI list of 176 zoological journals (it was 98 out of 125 in the previous year). The Journal continues to be truly international in terms of the geographical distribution of its authors; for volume **87** (2021) the corresponding authors represented 34 countries (of which the leaders were 17% USA and 13% Germany). The average publication time from receipt to Advance Access publication was 7 weeks for 2021.

Circulation for the Journal in 2022 was 28 institutional and 87 membership subscriptions (compared with 29 and 85 respectively for 2021). In addition, a further 2,551 institutions have electronic access to the Journal through publishers' collections (includes migrated figures; compared with 2,610 in 2021) and 975 have access through OUP's Developing Countries Offer (for details see http://www.oxfordjournals.org/access_purchase/developing_countries.html).

The new pricing structure has been fixed for 2023. The cost for an online-only subscription is £597/$1,136/€897 for institutional subscriptions and £747/$1,418/€1,119 for corporate subscriptions. Please see https://academic.oup.com/mollus/subscribe for more information.

Volume **88** (2022) contained 38 papers, research notes and review articles. In total, 94 manuscripts were submitted in 2022 (a decrease of 7.7% on the 122 in 2021) and the acceptance rate was 40%. The image of the nudibranch on the cover of Volume 89 was kindly donated by Jenny Stock.

Our board of Associate Editors now comprises Coenraad Adema (immunology, genomics, parasitology), Thierry Backeljau (molecular phylogenetics and genetics), Liz Boulding (population and reproductive biology), Robert Cameron (ecology and genetics of terrestrial gastropods), Richard Cook (agricultural malacology, physiology, feeding behaviour), Simon Cragg (life histories, sense organs), Mark Davies (marine ecology and behaviour), Dan Graf (freshwater bivalves), John Grahame (population genetics, morphometrics), Liz Harper (marine bivalves), Gerhard Haszprunar (microanatomy, 3D reconstruction, minor molluscan classes), Bernhard Hausdorf (terrestrial gastropods), Michal Horsák (ecology and biogeography of terrestrial gastropods), Yasunori Kano (systematics of vetigastropods, tropical ecology), Joris Koene (reproductive behaviour of gastropods), Nicole Limondin-Lozouet (palaeoecology), Manuel Malaquias (opisthobranchs), Peter Marko (marine biogeography and phylogenetics), Pablo Martín (freshwater ecology, life history), Ellinor Michel (ecology, freshwater gastropods), Jeff Nekola (community ecology of terrestrial gastropods), Nicolas Puillandre (neogastropods), Ellen Strong (freshwater and marine caenogastropods), Janet Voight (cephalopods), Janice Voltzow (microscopic anatomy), Heike Wägele (opisthobranch biology), Tony Walker (biochemistry, immunology, cytology), Suzanne Williams (molecular phylogenetics and genetics) and Yoichi Yusa (general ecology and behaviour). Nerida Wilson has temporarily stepped down from the editorial board.

I would like to thank all the members of the editorial board and those members of the international malacological community who have contributed to the review process. At Oxford University Press, I would like to thank Oluwatooni Akinkuotu (Publisher); Yasmin Bahar and Chloe Francis (Journal Managers); Jennifer Paxton-Boyd (Publishing Director for Science); and Matt Senderling (Marketing Coordinator). My thanks also to Gulshan Kumar, Shreya Shukla and their production team at Aptara Incorporated) for their work on behalf of the Journal.

The Website, reported on by John Grahame

There is little to report other than the day-to-day maintenance of the site, which continues and is very sporadic - it depends on what is happening! The main activity this past year has been keeping the Grant and Travel award documents current. Thanks in great part to the work of our Membership Secretary and our original site designer, the membership side of things is now working more smoothly.

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Facebook & Twitter, reported on by Jon Ablett and Lauren Sumner-Rooney

The Society's Facebook page (http://www.facebook.com/malacsoc/) continues to perform well. We currently have 3,265 followers on the page, continuing the trend of gradual increase over the years. We therefore have a direct outreach population of over 3,000 people/organisations who receive notifications about our posts, for example the post advertising the Society's 130th AGM has been seen by 3612 people to date. In terms of countries represented, we have the most followers from USA (487), followed by Mexico (335), the UK (243), Brazil (194), Italy (188), and the Philippines (166).The Society's twitter account currently has 830 followers and is another useful resource for communications.

Awards, reported on by Lauren Sumner-Rooney

Following Covid-related disruptions, one ECR (Early Career Research) award recipient was granted, an extension on their research project. We received 20 applications for ECR Awards in December 2022. Of these, eight were eligible for the Global Development Award. Given the challenges faced by young malacologists over the past two years, and the healthy financial position of the Society, ten ECR awards were granted, including two that qualified for Global Development awards.
Five applications for Travel Awards were received in December 2022 and all were awarded. We also received seven applications for Travel Awards in March 2023: six for the meeting '*Bivalves: where are we going?*' hosted at the University of Cambridge, and one for the International Conference of the World Association for the Advancement of Veterinary Parasitology in Chennai. Finally, two applications for Senior Research Grants made in June 2022 were awarded.

The Society received two nominations for the Annual Award before the new deadline of the 1st December. The winner of the Annual award for 2022 was Alison Irwin for her PhD thesis on the *Evolution and function of vision in strombids*. The reviewers agreed that this multifaceted body of work united the fields of evolutionary and sensory biology, demonstrated a range of skills, and provided new insights to the biology of this fascinating family and their ecology.

Early Career Research Awards

Coline Monchanin: *Giant clams population, health and role as substrate for scleractinian corals in Thai waters*. Aow Thai Marine Ecology Center Thailand, **£1450**
Elea Giraud: *Ecological and evolutionary trade-offs in specialised predator- prey relationship where the prey is also a predator.* University of Portsmouth UK, **£1,468**
Jesús Martínez Sanjuán: *3D morphoanatomic study and molecular systematics of Pruvotinidae (Mollusca, Aplacophora)*. Unviersity of Alabama USA, **£1500**
Jose Armando Vidal Miralles: *Between sea angels and butterflies: a comprehensive phylogeny of Pteropoda molluscs*. University of Barcelona Spain, **£1,497**
Jose Fernandez-Simon: *Diversity and characterization of the meiofaunal molluscs of the Catalan coast (Western Mediterranean)*. University of Barcelona Spain, **£1,450**
Karolina Magdalena Zarzyczny: *The genetic consequences of tropicalisation by intertidal gastropods*. University of Southampton UK, **£1500**
Leila Belén Guzmán: *Comparative mitogenomics and phylogenetics of Biomphalaria, snails transmitting schistosomiasis*. Universidad Nacional de La Plata, Argentina, **£1500**
Nimanthi Abeyrathna: *Genetic characterization of parasites in the invasive snail Cipangopaludina chinensis in the US*. Clarkson University USA, **£1,450.**
Nipu Kumar Das: *Non-marine molluscs of anthropogenically impacted caves of Meghalaya: Understanding diversity and threats for conservation*. ATREE, University Bangalore India, £1500
Zeyuan Chen: *Whole-genome sequencing project of Sadleriana bavarica Boeters, 1989*. Zoologische Staatssammlung Munchen, Germany, **£1500**

Senior Research Awards

Louise Firth: *Data rescue and reuse: archiving historical datasets to address new environmental challenges*. University of Plymouth, **£1445.**
Chiara Papetti: *Estimation of mutation rates in the Venus clam Chamelea gallina*, University of Padova, **£1274**

Travel Awards, March 2023

- Andy Tan, **£500**
- Eulynn Low, **£300**
- Ranita Saha, **£500**
- Taro Yoshimura, **£500**
- Matthias Desmolles, **£300**
- Matteo Garzia, **£300**
- Ruiqi Li, **£500**
- Yue Deng, **£500**
- Aniket Mitra, **£500**
- Isobel Ollard, **£500**
- Tabitha Blackwell, **£500**
- Alessandro Formaggioni, **£300**
- Sam Tan, **£300**

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Other matters

From this year, the Society is offering payment of Travel Awards upfront, to alleviate financial pressure on recipients. The deadlines for applications have also been shifted to better reflect the academic and conference seasons:

1st March for travel between 1st June and 30th November
1st September for travel between 1st December and 31st May

Change to Rules of the Society

It is proposed that the rules of the Malacological Society of London are changed to better comply with the running and activities of the Society in its current form. The Rules will be voted on my members of the Society at the AGM.

Presidents Report

This has been my second year as President, and thanks to the wonderful people that make up the council it has been a enjoyable and productive time for me and I feel for the society as a whole. A highlight for me this year has been a return to in-person conferences with the Molluscan Forum in November and the William Benson symposium later on today. Such in - person meetings provide a great space not only for students and early career researchers to share their work but also allow a chance for people to discuss problems and issues, learn from each other and to network. However by introducing a hybrid element to our meetings, I hope we are able to reach new audiences and presenters who may be unable to engage with the society and further the opportunities and experiences for learning that the Society provides.

Along with the meetings, and of course the journal which Dinazarde Raheem runs with incredible diligence and dedication, I believe that the support provided by our awards and grants are a real pinnacle of the society's work. I would like to thank the council and Lauren Sumner-Rooney and Harriet Wood in particular for all their hard work on the new Global Development Awards, the Equity and Inclusion Awards and the Broadening Access Membership Scheme which started this year. As a Society we are in the incredible fortunate position to have the financial ability to fund these schemes – which require extra planning, input and implementation for the officers involved - but which I hope will allow the MSL to reach new audiences and to engage globally with students and researchers across malacology. It is an honour to be the current President and I would like to recognise all that the council do for the society and I look forward to working with everyone in the forthcoming year.

Members elected to Council at the 130th Annual General Meeting 2023

Year of existence	2022-2023	2023-2024
	129	130
President	Jon Ablett (2)	Jon Ablett (3)
Vice Presidents	Fiona Allan (2)	Fiona Allan (3)
	Phillip Hollyman (1)	Phillip Hollyman (2)
Ex officio		
Councillors	Alan Hodgson (3)	Aidan Emery (3)
	Aidan Emery (2)	Robert Cameron (3)
	Robert Cameron (2)	Victoria Sleight (3)
	Victoria Sleight (2)	Katie Collins (3)
	Katie Collins (2)	Rowan Whittle (2)
	Rowan Whittle (1)	John Grahame (2)
	John Grahame (1)	
EC-Rep	Thomas Goulding (1)	Thomas Goulding (2)
Co-opted	Phil Fenburg (1)	Phil Fenburg (2)
	Crispin Little (1)	Crispin Little (2)
		Alan Hodgson (1)
Journal Editor	Dinazarde Raheem	Dinazarde Raheem
Bulletin Editor	Georges Dussart	Georges Dussart
Treasurer	Katrin Linse (final year)	Katrin Linse (final year)
Membership Secretary	Harriet Wood (2)	Harriet Wood (3)
Hon. Secretary	Debbie Wall-Palmer (2)	Debbie Wall-Palmer (3)
Web manager	John Grahame (web)/Chong Chen (Facebook)	John Grahame (web)/Victoria Sleight (Facebook)
Awards Officer	Lauren Sumner Rooney (2)	Lauren Sumner Rooney (3)
Archivist	Andreia Salvador (2)	Andreia Salvador (3)

(Numbers in brackets indicate number of years in office)

Rules revision
Rules of the Society as amended by the 130th AGM 2023

I. NAME

The Society shall be called The Malacological Society of London.

II. OBJECTS

The objects of the Society are to advance education, research and learning for the public benefit in the study of molluscs from both pure and applied aspects. In furtherance of these objects, but not further or otherwise, the Society shall have the following powers:

(a) To promote and co-ordinate meetings and symposia,
(b) To promote and co-ordinate research both pure and applied;
(c) To provide for the worldwide dissemination of the useful results of such research by publication of the *Journal of Molluscan Studies*;
(d) To award prizes to outstanding students in the field of molluscan biology;
(e) To award research grants to individuals which will advance the study of molluscan biology;
(f) To do all such things as will further the objects of the Society
(g) To award travel and membership support to students and earlycareer scientists in the field of molluscan biology.

III. MEMBERSHIP

Membership will be open to all individuals who are interested in the study of molluscs, both from pure and applied aspects.

(a) There will be Student Members, Ordinary Members and Honorary Members. Honorary Members shall currently be limited to five; they shall be exempt from all payments and receive the same privileges as Ordinary Members. They shall be nominated by the Council and such nominations shall be confirmed at the ensuing Annual General Meeting.
(b) Members shall be entitled to online access the Journal of Molluscan Studies together with such circulars as may be issued during their membership.
(c) The Council has the discretion to remove any member that is considered to fall below a standard acceptable to the Society but shall not exercise these powers unreasonably.

IV. MANAGEMENT

The business of the Society shall be managed by a Council elected at Annual General Meetings of the Society. The Council shall comprise the Honorary Officers (President, Treasurer, Secretary, Membership Secretary, Editor of the Journal, Editor of The Malacologist, Archivist, Website Manager, Facebook Manager, Twitter Manager, Early Career Representative and Awards Officer), the immediate Past-President (*ex-officio* for one year), two Vice-Presidents and six Ordinary Members. One individual may hold more than one council position/role. In addition, Council may co-opt up to four members on an annual basis.

Vice-Presidents and Ordinary Members of Council are elected for three years and shall not be eligible for re-election in their respective offices for one year; the Officers of the Society shall be eligible for re-election each year, but the President shall normally serve for three years and upon retirement shall serve as a Vice-President (*ex officio*) for one year. Treasurer, Secretary and Membership Secretary shall normally serve for three years but shall be eligible for re-election after each three year period of service and can be re-elected indefinitely with agreement of the Council and the membership.

Nominations for Council from members must be proposed and seconded and in the hands of the Secretary by 31 December. It shall be the duty of Council to nominate members for election to the offices of President, Treasurer, Secretary, Membership Secretary, Editor of the *Journal,* Editor of *The Malacologist*, Archivist, Website Manager, Facebook Manager, Twitter Manager, Early Career Representative and Awards Officer, and for the vacancies in the Council caused by annual retirement. Nominations from the members and from Council shall be submitted to the Society with the notice convening the Annual General Meeting which shall be sent to every member of the Society not less than fourteen days before the Meeting.

In the case of a vacancy arising in any office of the Society, or in the Council, the Council shall have power to fill up such vacancy until the next Annual General Meeting.

At Council Meetings any six members shall form a quorum.

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V. FINANCE

(a) Admission fees and annual subscriptions shall be such sums as may be determined by a Special General Meeting convened under Rule VI(c), or at the Annual General Meeting.
(b) Subscriptions shall be due from the 1 January in each year; but in the case of a new member, immediately after election.
(c) Any member whose current subscription has not been received in full by 31 January shall be reminded of the arrears in subscription and be informed that online access of the Journal, and other membership benefits, are suspended until the arrears are paid.
(d) The Council shall revise and publicize the conditions of the Society's awards and grants from time to time.
(e) For the purpose of legal protection of the property of the Society, all funds, books and other property shall be declared vested in Council as the Society's Trustees.
(f) The Council shall cause to be kept Minutes of Council and Society Meetings and books of account in respect of all receipts, payments, assets and liabilities. Accounts shall be presented to each Annual General Meeting for approval by members and such accounts shall be independently examined.

VI. MEETINGS

(a) Council shall each year organize a programme of Ordinary Meetings of the Society, which may include meetings held in association with similar institutions.
(b) The Annual General Meeting shall be held at some time during the period February to April.
(c) The Council may, when they think fit, and shall upon a Requisition signed by not fewer than twelve members, convene a Special General Meeting of the Society. A notice of every Special General Meeting, stating the business, shall be sent to every Member of the Society not less than fourteen days before such meeting or announced in the Bulletin; no business shall be considered at such Meeting except that for which it was specially convened.
(d) Council shall meet regularly though out the year to discuss society business.

VII. RULES

Matters relating to the interpretation of the Rules shall be decided by the Council.

VIII. AMENDMENT

No rule shall be altered except by a majority of votes of those present at a Special General Meeting called for the purpose, or at the Annual General Meeting. No change shall be made that would have the effect of causing the Society to cease to be a Charity in Law.

IX. WINDING UP

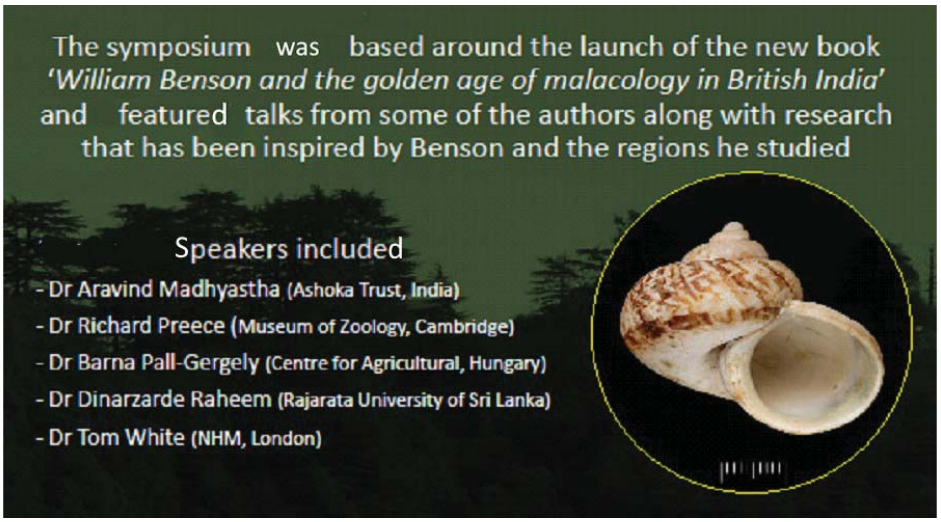
If upon winding up or dissolution of the Society there remains, after the satisfaction of all its debts and liabilities, any property whatsoever, the same shall not be paid or distributed among the members of the Society, as such, but shall be given or transferred to some other charitable institution or institutions having objects similar to the objects of the Society and which shall prohibit the distribution of its or their income and property among its or their members, such institution or institutions to be determined by the members of the Society at or before the time of dissolution, and if so far as effect cannot be given by such provisions, then to some charitable object.

(Adopted 17 May 1978, revised 25 March 1998, 19 March 2001, 28 April 2005 and 29 March 2023)

From a Facebook post

Report on the AGM associated scientific meeting
Wednesday 29 March 2023

William Benson and the Golden Age of Malacology in India



This meeting followed the AGM of the Malacological Society of London. Talks were given in the Flett Theatre, Natural History Museum, London by an international team of malacologists and were followed by a wine reception. This free meeting was attended by participants in-person and virtually via Zoom.

Programme

12.30 AGM for Council and Members

14.00 Symposium welcome and introductions

14.10 Richard Preece (Museum of Zoology, Cambridge) '
William Benson and the golden age of malacology in British India'

14.40 Tom White (NHM, London)
'*William Benson, his successors, and his legacy'*

15.10 Dinazarde Raheem (Rajarata University of Sri Lanka) '
The Sri Lankan land-snail fauna: Benson's contribution and recent research on Corilla'

15.40 Coffee break

16.10 Aravind Madhyastha ((Ashoka Trust, India)
'*Benson, Godwin-Austen and the current status of studies on nonmarine molluscs of India'*

16.40 Barna Pall Gergely
'*It all began with Benson'*

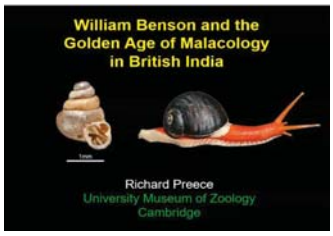
17.15 Closing Remarks

17.30 Wine Reception

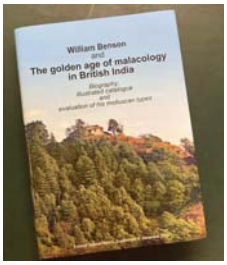
Some of the joint authors of the Benson publication
L-R Tom White, Richard Preece & Jon Ablett

Richard Preece
Museum of Zoology, Cambridge

William Benson: pioneer of the golden age of malacology in British India

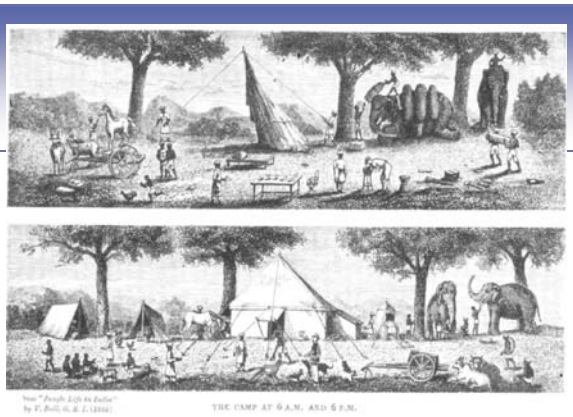


William Henry Benson (1803-1870) made extensive collections of molluscs, particularly land snails, from South Africa, Mauritius, and especially from the Indian subcontinent, where he worked for the East India Company's Bengal Civil Service. He also received specimens from friends, family and a network of colleagues that included naturalists, physicians, clergy, military personnel and staff of the Geological Survey of India. By this means he obtained material from diverse and often remote parts of India, as well as from Burma, Sri Lanka, China, Borneo, Singapore, Australia, St Helena and Cape Verde. Biographical details of Benson and his malacological network are discussed, as is his pioneering role initiating the golden age of malacology in British India. In a series of papers published between 1829 and 1865, he introduced 471 species-level names belonging to 60 families of gastropod and 8 families of bivalve, as well as names for 32 genus-groups. Benson gifted or exchanged many specimens with other researchers, and many ended up in the British Museum and are now housed in the Natural History Museum in South Kensington. However, the bulk of his collection was acquired after his death by Robert McAndrew, who incorporated it into his own huge collection, which he bequeathed to the University Museum of Zoology, Cambridge (UMZC) in 1873. The Benson collection suffered badly before it was acquired by the UMZC and many of Benson's original labels were replaced with the loss of detailed locality and other data, making it difficult to evaluate the type status of many specimens. In a new publication we have attempted such an evaluation based on surviving archival and other evidence and we provide a comprehensive illustrated catalogue of his species, designating lectotypes and neotypes where appropriate. His taxa have been set in a modern systematic framework and the volume includes a comprehensive geo-referenced index of localities for the taxa considered.

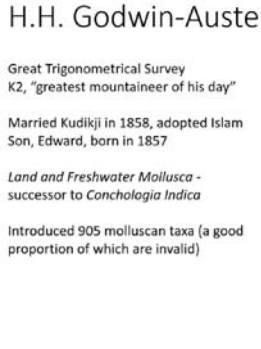


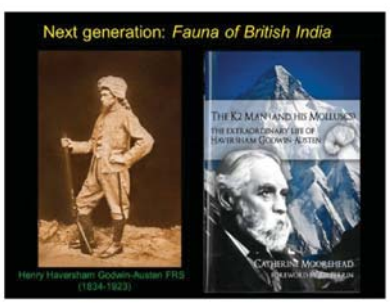
Tom White
NHM, London

William Benson: his successors and his legacy



William Benson's pioneering work laid the foundations for subsequent research by such notable malacologists as W.T. Blanford, H.H. Godwin-Austen and G.K. Gude. Following Benson's death in 1870, his collection was acquired by Robert McAndrew, who integrated it into his own large collection of mainly marine shells. McAndrew loaned the Benson collection to Sylvanus Hanley, who had many of the specimens figured for *Conchologia Indica*, the first major illustrated work on Indian non-marine Mollusca, which he co-authored with William Theobald. In 1873 the Benson collection was bequeathed, as part of the McAndrew collection, to the University Museum of Zoology, Cambridge. By this time, many of Benson's original labels had been replaced (mainly by Hanley) and his manuscript notebooks mislaid; nevertheless, his material continued to be a primary source for publications such as the molluscan volumes of *Fauna of British India* and Godwin-Austen's *Land and Freshwater Mollusca of India.* The 'Golden Age' of Indian malacology that began with Benson's early work in the 1820s concluded with the deaths of Godwin-Austen and Gude in the early 1920s.





Dinarzarde Raheem
Rajarata University of Sri Lanka

The Sri Lankan land-snail fauna; William Benson's contribution and recent on Corillo

The Sri Lankan fauna is phylogenetically diverse and rich in endemic species. The total number of recognized indigenous species is 207, of which 186 (89%) are endemic to the island. Nearly all of these species were described during the 19th century and the first decade of the 20th century; William Henry Benson (1803–1870) was a hugely significant contributor to this work. Benson named 33 endemic species from the island, but his contribution goes far beyond that. He was well ahead of his time in the emphasis he placed on the geographical distribution of species, and by the 1850s was the leading authority on the British Indian land-snail fauna. He made only two short visits to the island, so nearly all of the species he named from the island were collected by Frederick Layard (1823–1872) and Edgar Layard (1824–1900). Since Benson's time, the Sri Lankan fauna has been treated as being distinct from the Indian fauna. However, it has been recognized only recently that the Sri Lankan fauna exhibits a high-level of localized endemism. What factors underlie this pattern? A first step to tackling that question is to establish what species there are in key groups, develop a solid grasp of their distribution and then to investigate their diversification. Being of manageable size (11 recognized species: 10 endemic to Sri Lankan and 1 to India), the genus *Corilla* is a particularly attractive group for such work. My recently published molecular phylogenetic study of Sri Lankan *Corilla*, which is based on restriction-site-associated DNA sequencing data, agrees with the shell-based taxonomy of five of the species (all maximally supported as monophyletic species). I found that *C. erronea* and *C. fryae* constitute a single relatively widespread species (for which the valid name is *C. erronea*). The most significant finding was that the names *C. gudei* and *C. odontophora*, as currently used, apply to at least two distinct, yet conchologically-cryptic species. Further surveys are likely to yield previously undiscovered species. However, the more urgent issue is to obtain highly detailed data on the distribution and habitat requirements of *Corilla* species surviving in the most severely deforested regions; the three species currently included under the Benson's name *C. odontophora* are a high priority.

Edgar Leopold Layard (1824–1900). https://en.wikipedia.org/wiki/Edgar_Leopold_Layard

Indoartemon layardianus **(Streptaxidae), a species collected by Edgar Layard and described by Benson. Photo D.Raheem**

Barna Páll-Gergely
Plant Protection Institute, Centre for Agricultural Research, Herman Ottó út 15, 1022 Budapest, Hungary

'It all began with Benson'

During the last decade I have been mostly working on taxonomic revisions of Southeast Asian land snail groups. The two largest and most widespread group I have been revising are the Alycaeidae (Cyclophoroidea) and Plectopylidae (Stylommatophora). The Alycaeidae currently contains ca. 350 accepted species from the Western Himalayas and the Western Ghats until Japan in the east. That family (that time as the genus *Alycaeus*) was first revised by William Henry Benson (1803–1870) in 1859, and included 20 species, of which 16 was described by him.

Currently, the family Plectopylidae includes ca. 120 species, and they are distributed between Himalayas to southern Japan. The genus *Plectopylis* was named and diagnosed by Benson in 1860. He realized that six species that were classified in multiple genera share the same characteristics (presence of internal lamellae), and needed a group of their own.

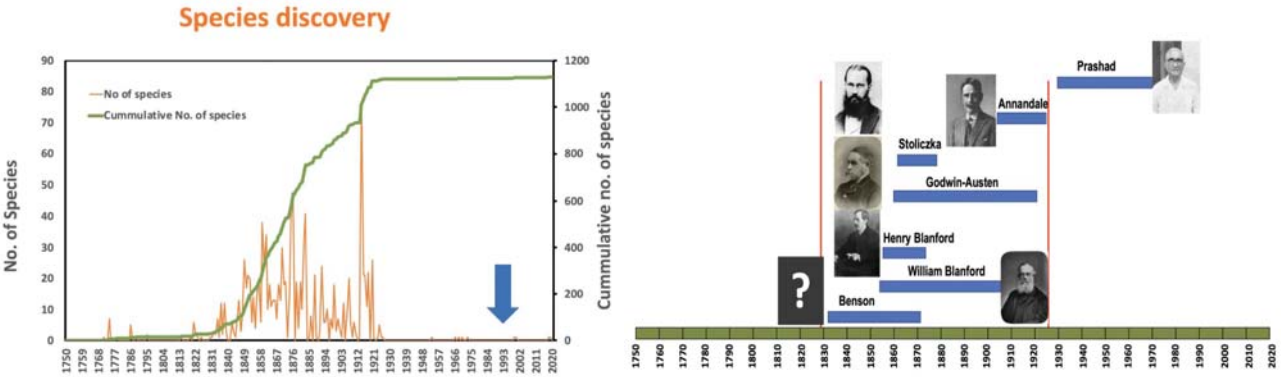
The majority of the species and genera of Benson are considered valid, which is not surprising because he was among the firsts to describe land species in British India. However, several groups (e.g. *Dioryx* Benson, 1859, Plectopylidae) are still diagnosed with the character that Benson originally observed. This indicates that he was an outstanding naturalist, whose work is referred to very positively after ca. one and a half centuries.

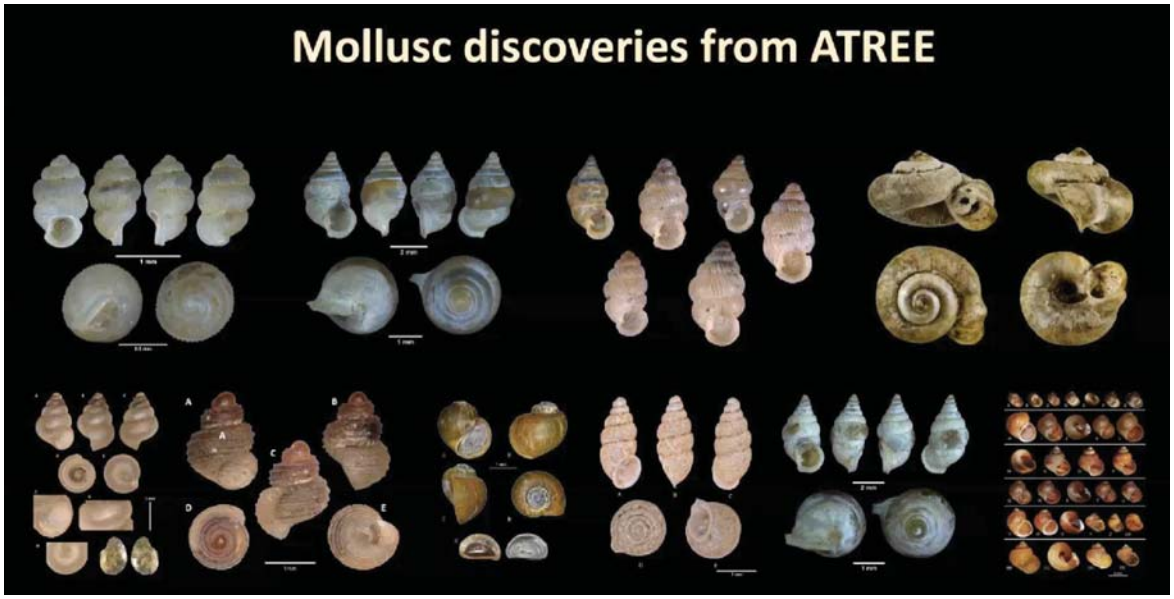
N.A. Aravind

Benson, Godwin Austen and the current status of studies on non-marine molluscs of India

SM Sehgal Foundation Center for Biodiversity and Conservation,
Ashoka Trust for Research in Ecology and the Environment (ATREE),
Royal Enclave, Srirampura, Jakkur PO,
Bangalore 560064, India

The realm of Indian malacology, particularly in relation to non-marine molluscs, witnessed significant growth through the pioneering efforts of William Benson during the early to mid-19th century. Subsequently, from that time until the year 1930, a host of European malacologists significantly enriched our knowledge of the systematics of molluscs. Among these malacologists, HH Godwin-Austen stands out as the final luminary who achieved significant achievements. Following his demise in 1923, the momentum of Indian malacology subsided, marked by limited contributions from a handful of researchers hailing from India. However, the landscape of Indian malacology experienced a renaissance during the latter half of the 20th century, largely catalysed by the pioneering endeavours of Fred Naggs from the Natural History Museum in London. His exploration of the works of William Benson ignited a spark of interest among numerous young malacologists in India. In the wake of this resurgence, our laboratory embarked on an extensive survey encompassing the documentation, systematics, biogeography, and conservation efforts pertaining to non-marine molluscs of India. Through these surveys, we made a substantial collection from over 500 distinct sites across India, encompassing an assemblage of more than 1,000 species and a staggering tally exceeding 20,000 specimens. My presentation elucidates how these comprehensive collections have been judiciously harnessed to unravel the intricacies of the aforementioned subjects. In conclusion, I deliberate upon the impending challenges and the abundant prospects that lie on the horizon, in the realm of non-marine mollusc research and conservation within the Indian context.





Obituary

Maryna Pauline PLESOWAY

June 18, 1980 - December 31, 2022

Dr. Maryna P. Lesoway was born in Edmonton and grew up in London, Ontario, and Calgary, Alberta. Maryna died at her home in San Diego on December 31, 2022.

After completing her Bachelor of Science in Zoology at the University of Calgary, Maryna completed a Master of Science in Biology at the University of Victoria. Maryna then took a break from the lab and spent two years teaching English in Kamikawa, Hokkaido, Japan. When she came home to Canada, Maryna moved on to PhD studies in Biology at McGill University and the Smithsonian Tropical Research Institute in Panama. Upon graduation, she took a postdoctoral fellowship at the University of Illinois Urbana-Champaign. Most recently, she was a postdoctoral scholar at the Scripps Institution of Oceanography, University of California, San Diego.

Maryna is survived by her parents, Robert and Linda Lesoway of Calgary, her grandmother, Katie Dyck of Edmonton, and her three siblings and their families: David and Colleen Lesoway and their son Vasyl, in Belmont, California; Kathryn Lesoway and David Shinner and their sons Jack and Cole, in Perth Australia; and Nicholas and Fiona Lesoway, in Beaumont, Alberta. Maryna is also survived by numerous aunts, uncles, cousins and friends. She was predeceased by her grandparents Peter Dyck and Nicholas and Josephine Lesoway and her step-grandfather, Henry Buhler.

Maryna was brilliant and beautiful and kind and good and talented and funny and strong and resilient and deep. We were so lucky to have basked in her love, even though our time with her was far too short. Our lives without her will never be the same. A celebration of Maryna's life was held on February 25, 2023, at 1:00 p.m. at the Eden Brook Funeral Home, 24223 Township Rd 242, Calgary, Alberta.

Vichnaia pamiat. May she always be remembered.

Marie Lesoway

Publications

Collin R, Shishido CM, Cornejo AJ, Lesoway M.P., 2020 Ancestral form and function of larval feeding structures are retained during development of non-planktotrophic gastropods. *The International Journal of Developmental Biology*. PMID 32930356 DOI: 10.1387/Ijdb.200154Rc

Henry JQ, Lesoway M.P., Perry KJ. 2020 An automated aquatic rack system for rearing marine invertebrates. *Bmc Biology*. 18: 46. PMID 32366250 DOI: 10.1186/S12915-020-00772-W

Armisén D, Rajakumar R, Friedrich M, Benoit JB, Robertson HM, Panfilio KA, Ahn SJ, Poelchau MF, Chao H, Dinh H, Doddapaneni HV, Dugan S, Gibbs RA, Hughes DST, Han Y, ... Lesoway M.P., *et al.* 2018 The genome of the water strider *Gerris buenoi* reveals expansions of gene repertoires associated with adaptations to life on the water. *Bmc Genomics*. 19: 832. PMID 30463532 DOI: 10.1186/S12864-018-5163-2

Henry JQ, Lesoway M.P., Perry KJ, Osborne CC, Shankland M, Lyons DC. 2017 Beyond the sea: *Crepidula atrasolea* as a spiralian model system. *The International Journal of Developmental Biology*. 61: 479-493. PMID 29139534 DOI: 10.1387/Ijdb.170110Jh

Lesoway M.P., Collin R, Abouheif E. 2017 Early Activation of MAPK and Apoptosis in Nutritive Embryos of Calyptraeid Gastropods. *Journal of Experimental Zoology. Part B, Molecular and Developmental Evolution*. 328: 449-461. PMID 28656657 DOI: 10.1002/Jez.B.22745

Lesoway M.P., Abouheif E, Collin R. 2016 Comparative Transcriptomics of Alternative Developmental Phenotypes in a Marine Gastropod. *Journal of Experimental Zoology. Part B, Molecular and Developmental Evolution*. 326: 151-67. PMID 27194576 DOI: 10.1002/Jez.B.22674

Lesoway M.P., 2016 The future of Evo-Devo: the inaugural meeting of the Pan American Society for evolutionary developmental biology. *Evolution & Development*. 18: 71-7. PMID 26773456 DOI: 10.1111/Ede.12181

Lesoway M.P., Abouheif E, Collin R. 2014 The development of viable and nutritive embryos in the direct developing gastropod Crepidula navicella. *The International Journal of Developmental Biology*. 58: 601-11. PMID 25690974 DOI: 10.1387/Ijdb.140136Rc

Abouheif E, Favé MJ, Ibarrarán-Viniegra AS, Lesoway M.P., Rafiqi AM, Rajakumar R. 2014 Eco-evo-devo: the time has come. *Advances in Experimental Medicine and Biology*. 781: 107-25. PMID 24277297 DOI: 10.1007/978-94-007-7347-9 6

Mcdonald KA, Collin R, Lesoway MP. 2014 Poecilogony in the caenogastropod *Calyptraea lichen* (Mollusca: Gastropoda) *Invertebrate Biology*. 133: 213-220. DOI: 10.1111/Ivb.12057

Lyons DC, Perry KJ, Lesoway MP, Henry JQ. 2012 Cleavage pattern and fate map of the mesentoblast, 4d, in the gastropod *Crepidula:* a hallmark of spiralian development. *Evodevo*. 3: 21. PMID 22992254 DOI: 10.1186/2041-9139-3-21

Early career research grant reports

Research financially supported by the Malacological Society of London

Non-marine molluscs of anthropogenically impacted caves of Meghalaya: understanding diversity and threats for conservation

Nipu Kumar Das[1,2]

[1]SM Sehgal Foundation Center for Biodiversity and Conservation, Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore, Royal Enclave, Jakkur, 560064, Karnataka, India
[2]Manipal Academy of Higher Education (MAHE), Manipal, Karnataka, India

INTRODUCTION

Cave biodiversity studies have been conducted globally, documenting diverse molluscan species and their compositions in unique cave habitats. These caves possess distinct environments characterized by darkness, high humidity, low temperatures, and hypoxic conditions, fostering unique faunal diversity (Culver & Pipan 2019; Biswas 2009). Biospeleology, the study of cave organisms, aids in understanding regressive evolution and conserving endemic species. Caves provide ideal habitats for numerous taxa, including molluscs, with the discovery of the world's smallest snail species (Dumrongrojwattana *et al*., 2021). These cave species are highly sensitive to environmental changes, anthropogenic activities, and climate change, highlighting the importance of understanding their diversity, ecology, and relationship with environmental parameters.

Regrettably, India's caves have received limited exploration; only a few specific caves have been investigated. Studies conducted in caves such as Siju Cave (Garo hills, Assam), Kotumsar Cave (Chhattisgarh), Borra Cave (Visakhapatnam, Andhra Pradesh), and Mawsmai Cave (Meghalaya) have focused mainly on taxonomy and species listing, lacking in-depth studies on molluscan ecology and microhabitat associations. There is a lack of comprehensive data on the number of mollusc species inhabiting these unique environments.

Potential non-marine cave mollusc species may exist in the Naga hills, Arunachal Pradesh, and other northeastern states of India. Recent surveys in Mawsmai Cave documented two microsnail species, *Acmella tersa* and *Georissa mawsmaiensis*, along with their natural history and potential threats (Das & Aravind., 2021; Das *et al*., 2021). Meghalaya, known for its abundance of limestone caves, faces threats from activities such as mining, tourism, and recreation. Therefore, my research aimed to investigate the molluscan fauna within selected caves in Meghalaya to bridge existing knowledge gaps.

MATERIAL & METHODS

Meghalaya, an Indian northeastern state, borders Bangladesh to the west and south, and Assam to the east and north. It features a hilly plateau with an average altitude of 1000 meters (Harries *et al*., 2008). This study focused on sampling non-marine molluscs in Meghalaya's caves, both land and freshwater species (Figure 1-2). Mawsmai cave is being resurveyed following research conducted by Das *et al*. in 2021. Opportunistic sampling was conducted both inside (to approx. 10 m inside, targeting the cave floor and walls) and outside the caves (nearby the cave entrance, within 150-200 m from the forest floor). Soil-leaf litter samples were collected from each forest plot and stored for later sorting. Visual searches were conducted outside the caves, targeting tree trunks and under logs to collect arboreal and cryptic species. If present, freshwater molluscs were sampled from streams. Site characteristics such as canopy cover, litter depth, vegetation cover, altitude, soil pH, and microhabitat type were recorded to assess habitat variables and cave ecosystem characteristics.

Species identification relied on different shell characters, with relevant literature serving as a reference. Collected specimens were preserved in ethanol and deposited at the Zoological Survey of India in Kolkata.

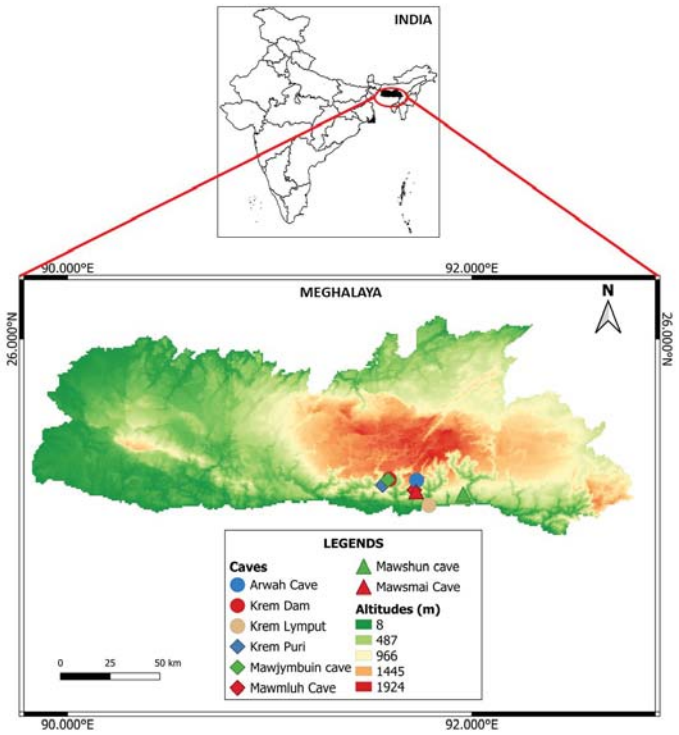


Figure 1 Map of caves sampled in Meghalaya, India

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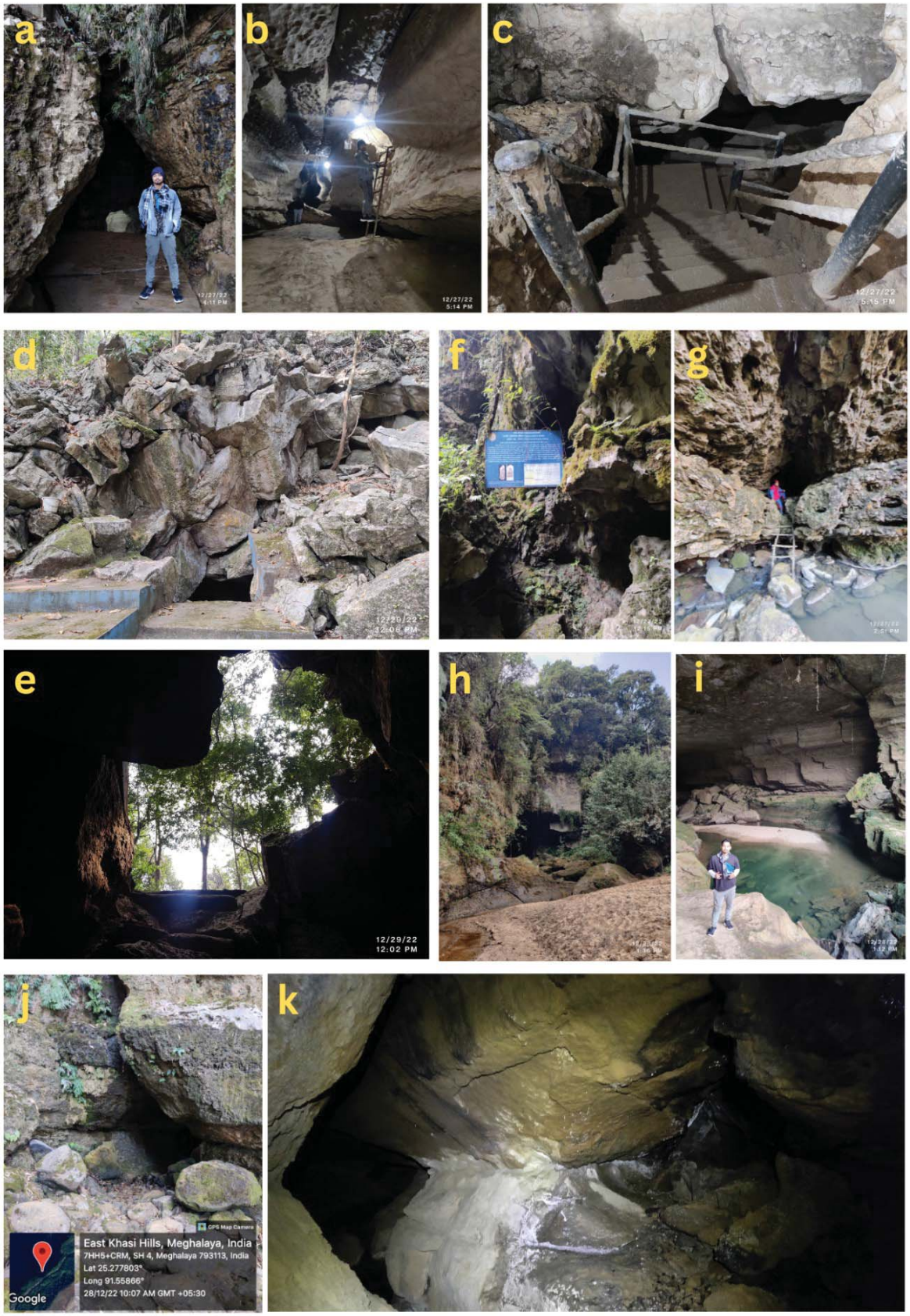

Figure 2: The surveyed limestone caves of Meghalaya: Arwah cave(a-c), Krem Lymput (d-e), Mawmluh cave (f-g), Krem Dam (h-i), Krem Puri (j-k),

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Figure 2 continued The surveyed limestone caves of Meghalaya: Mawjymbuin cave (l-n) & Mawshun cave (o-p).

RESULTS

Diversity

We surveyed eight limestone caves in various altitudes of Meghalaya and collected molluscs from both inside and outside the caves (Figure 1-2). In total, we identified 49 species of land molluscs belonging to 27 genera and 15 families (Table 1). Mawsmai cave was being resurveyed following the research conducted by Das *et al*. in 2021, and the resurvey confirmed the presence of the same snail species composition in the interior. A significant proportion of the species are potentially new to science. The diversity of molluscs varied among the caves as well as between the inside and outside habitats (Figure 3-4). Among all the caves surveyed, Krem Lymput exhibited the highest diversity of malacofaunal composition, with five species found inside the cave and 31 species found outside.

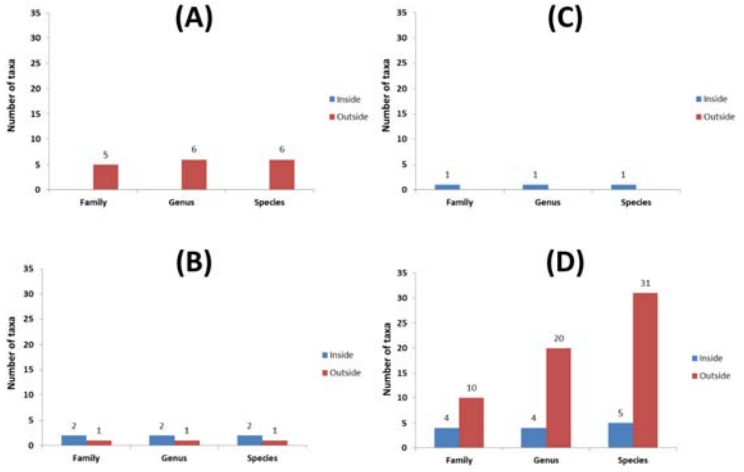

Figure 3: Number of taxa across the surveyed caves; (A) Mawshun cave, (B) Krem Puri, (C) Arwah, Mawjymbuin, and Mawmluh caves, (D) Krem Lymput.

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Table 1: Molluscan diversity across the surveyed caves in Meghalaya

Cave	Latitude	Longitude	Inside/ Outside	Family	*Species*
Mawmluh Cave	25.253222	91.714566	Inside	Helicarionidae	*Cryptaustenia sp1*
Arwah Cave	25.301939	91.72691	Inside	Assimineidae	*Acmella sp1*
Krem Puri	25.2777803	91.55866	Inside	Hyselostomatidae	*Angustopila milium*
			Inside	Assimineidae	*Acmella sp2*
			Outside	Hydrocenidae	*Georissa sp*
Krem Dam	25.30694	91.592073	No specimens found; fossilized freshwater snails on the rocks (Figure 6.3.u)		
Mawjymbuin cave	25.3046572	91.5850165	Inside	Hyselostomatidae	*Angustopila milium*
Mawshun cave	25.232175	91.957224	Outside	Diplommatinidae	*Diplommatina sp*
			Outside	Ariophantidae	*Macrochlamys cf molecula*
			Outside	Plectopylidae	*Endothyrella affinis*
			Outside	Helicarionidae	*Cryptaustenia sp2*
			Outside	Cyclophoridae	*Spiraculum cf nagaense*
			Outside	Cyclophoridae	*Cycllophorus sp*
Krem Lymput	25.178353	91.787333	Inside	Assimineidae	*Acmella sp4*
			Inside	Assimineidae	*Acmella sp3*
			Inside	Succineidae	*Succinea sp*
			Inside	Ariophantidae	*Khasiella sp*
			Inside	Cyclophoridae	*Scabrina sp*
			Outside	Diplommatinidae	*Diplommatina diplocheilus*
			Outside	Cyclophoridae	*Craspedotropis sp*
			Outside	Alycaeidae	*Alycaeus prosectus*
			Outside	Alycaeidae	*Alycaeus cf andamaniae*
			Outside	Alycaeidae	*Chamalycaeus sp1*
			Outside	Alycaeidae	*Dicharax cf hebes*
			Outside	Ariophantidae	*Sesara galea*
			Outside	Achatinidae	*Rishetia tenuispira*
			Outside	Plectopylidae	*Endothyrella cf affinis*
			Outside	Pupinidae	*Pseudopomatias pleurophorus*
			Outside	Cyclophoridae	*Scabrina cf phaenotopica*
			Outside	Chronidae	*Kaliella cherraensis*
			Outside	Pupinidae	Tylotoechus imbriciferus
			Outside	Plectopylidae	*Pleclopylis cf plectostoma*
			Outside	Achatinidae	*Glessula crassula*
			Outside	Achatinidae	*Glessula sp1*
			Outside	Achatinidae	*Glessula sp2*
			Outside	Clausiliidae	*Oospira loxostoma*
			Outside	Cyclophoridae	*Cyclophorus affinis*
			Outside	Ariophantidae	*Macrochlamys sp1*
			Outside	Ariophantidae	*Macrochlamys cf lata*
			Outside	Ariophantidae	*Macrochlamys cf vesica*
			Outside	Ariophantidae	*Oxytesta pollux*
			Outside	Camaenidae	*Chloritis delibrata v khasiensis*
			Outside	Camaenidae	*Chloritis sp*
			Outside	Cyclophoridae	*Cyclophorus siamensis*
			Outside	Cyclophoridae	*Cyclophorus sp*
			Outside	Ariophantidae	*Oxytesta cf oxytes*
			Outside	Plectopylidae	*Endothyrella sp1*
			Outside	Plectopylidae	*Endothyrella sp2*
			Outside	Cyclophoridae	*Pearsonia cf hispida*
Mawsmai Cave	25.245	91.72405	Inside	Assimineidae	*Acmella tersa*
			Inside	Hydrocenidae	*Georissa mawsmaiensis*

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Ecological features:

The interior and exterior environments of the caves exhibit temperature ranges of 17-21.5 °C and 16.8-23.3 °C, respectively, while the humidity ranges between 64-70% and 61-71%, respectively (Figure 5). The soil pH outside the caves ranged between 7 and 8.

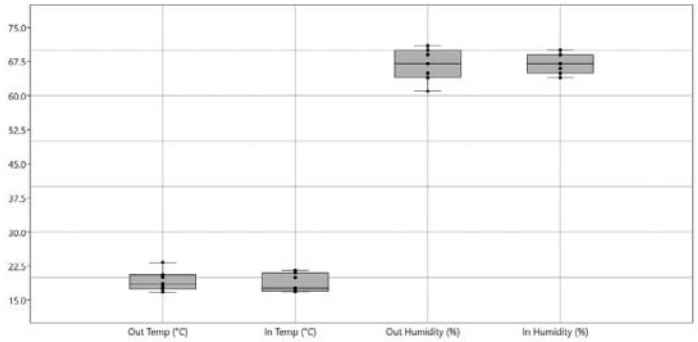

Figure 5 Temperature and humidity comparisons between interior and exterior environments across the surveyed caves

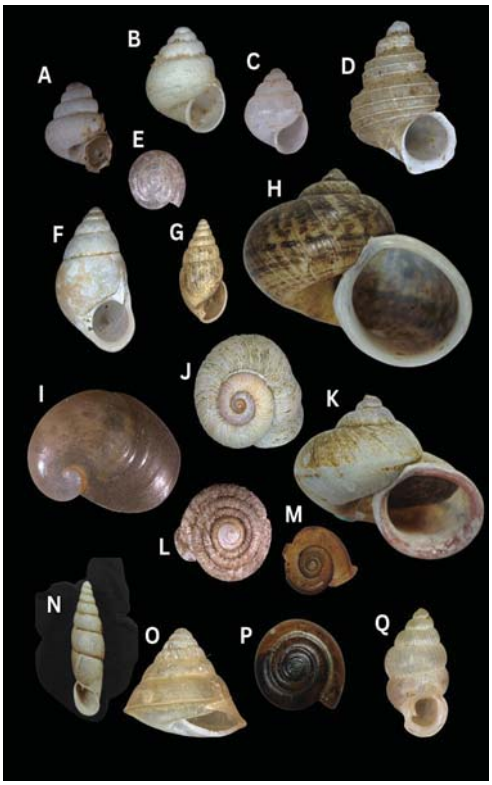

Figure 4 Representatives specimens from the caves and their surroundings. *Angustopilla milium* (A), *Acmella* sp1 (B), *Acmella* sp3 (C), *Craspedotropis sp* (D), *Macrochlamys cf molecula* (E), *Tylotoechus imbriciferus* (F), *Glessula*

Threats *(Figure 6)*:

Mawmluh cave faced a potential threat due from the presence of a cement factory (Mawmluh-Cherra Cements Ltd.), located outside, although it ceased operations around 2012-2014 (according to local guides). Water flowing from the cement factory, connects with the water flowing out of the cave. Inside the cave, plastic litter (plastic bottles) can be observed near the exit for a distance of approximately 100 meters.

Arwah and Mawsmai caves, being a popular tourist destination, had artificial lights installed throughout the cave, creating a bright internal environment. Staircases were constructed at the entrance to facilitate tourist access.

Krem Puri, Mawjymbuin cave, and Krem Dam are also significant tourist sites in Meghalaya. Although no signs of pollution were found, the presence of tourist footfall in these caves may have an impact on the faunal composition.

Mawshun cave stood out as the most natural cave among all the surveyed sites. In Krem Lymput, a long cemented staircase, approximately 500 meters in length, was constructed from Hat Nangjri road to the cave entrance. The cave and its surroundings have been developed as a resort, with various amenities such as cemented and bamboo houses, toilet facilities, water supply, power supply both in and near the cave. Additionally, there is a betel nut plantation surrounding the cave.

Figure 6
1. Potential threats like Plastic wastes (q-r), artificial lighting and tourists (s) observed inside the Arwah cave
2. Measuring the temperature using digital thermometer (t);
3. Fossil of freshwater snails observed inside the Krem Dam (u);
4. Collection of microsnails from the wall of Krem Puri (v)

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DISCUSSION & CONCLUSION

The survey conducted in Meghalaya's caves revealed a diverse molluscan fauna both inside and outside the caves. Notably, several species that are potentially new to science were discovered, highlighting the importance of further exploring the biodiversity of these caves. Meghalaya has numerous limestone caves, making it a crucial area for cave research and conservation efforts.

The study also indicated that the collected mollusc species are adapted to the cold and humid environments prevalent in the caves. Fluctuations in temperature and humidity within these caves and their surroundings may have an impact on the composition of the faunal communities. Understanding the effects of these environmental factors is crucial for assessing and preserving the delicate ecosystems within the caves.

One of the findings of the study was the identification of a potential pollution source for Mawmluh Cave. The presence of a cement factory located outside the cave raised concerns regarding water contamination, which could potentially affect the composition of snail populations in the cave. This highlights the need for proactive measures to address and mitigate such pollution sources to safeguard the unique fauna within the caves.

Overall, the study suggests the importance of further research and conservation efforts in Meghalaya's caves, considering their rich biodiversity and the potential threats they face. By understanding the ecological dynamics and implementing appropriate conservation strategies, we can protect and preserve these remarkable cave ecosystems and the species that depend on them.

ACKNOWLEDGMENTS

I am grateful to Malacological Society of London for the Early-Career Research Award, and Dr. NA Aravind (ATREE) for his support and guidance. Special thanks to Dibya Jyoti Das for invaluable assistance during data collection. I express my gratitude to Meghalaya Biodiversity Board for permitting field work (No.SBB.19/ABS/Pt.-IV/8243). I am thankful to the people of Meghalaya.

OUTCOMES

One paper of this work has been submitted to the *Journal of Conchology*. Several others are currently under preparation.

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Senior research award report

Research financially supported by the Malacological Society of London

Standing on the shoulders of giants: archiving Rosemary Bowman's historical limpet data

Louise B. Firth

School of Biological and Marine Sciences, University of Plymouth, Plymouth, Pl4 8AA.
Email:

In summer 2022, I was the proud recipient of the Malacological Society Senior Research Grant award. This grant helped support a placement student with the digitization of hundreds of files of the late Dr Rosemary Bowman.

Rosemary Bowman (1943-2021) was a marine biologist who spent much of her working life at the University of Leeds' Wellcome Marine Laboratory in Robin Hoods Bay, North Yorkshire. Rosemary is best well known for her incredibly detailed work on limpet morphology, reproduction and recruitment but being a key member of the Natural Environment Research Council (NERC) Rocky Shore Surveillance Group, she was an all-round rocky shore ecologist with expertise on trochids and barnacles amongst many other taxa.

Rosemary worked closely with John (Jack) Lewis - Director of the laboratory. Jack was an international authority on rocky shore ecology, who conducted extensive research on the development and distribution of rocky shore organisms. Alongside Jack and the rest of the NERC Rocky Shore Surveillance Group, Rosemary surveyed rocky intertidal species across the whole of Britain and to a lesser extent, Ireland and France. On collating her spreadsheets and meticulous field notebooks, it became apparent that she had spent an incredible amount of time on the shore at Robin Hood's Bay in particular. Despite the Wellcome Marine laboratory closing in 1982, we discovered that between 1972 and 1997 Rosemary visited the shore monthly (and sometimes up to five times monthly) during limpet reproductive seasons, trying to capture the exact timing of spawning of the limpets - *Patella vulgata* and *P. ulyssiponensis* (formerly *P. aspera*). This enabled her to identify the importance of temperature and other climatic factors (e.g., storms) in influencing spawning (Bowman and Lewis 1977, 1986).

In addition to collecting what must be one of the most in-depth breeding phenology datasets on any organism, Rosemary also revisited many fixed plots on the shore collecting regular data (Figure 1) on limpet and barnacle spat, juveniles and adults amongst other variables. This enabled her to determine the factors affecting survival of a range of organisms during early shore life (Lewis and Bowman 1975; Bowman and Lewis 1977; Bowman 1985; Kendall et al. 1982, 1985), in addition to producing the 'go-to' guide on juvenile limpet identification (Bowman 1981). She also investigated the impacts of oil pollution on marine life (Bowman 1978).

In 1981, Rosemary deployed temperature probes on the shores around Robin Hood's Bay. Despite the laboratory closing in 1982, she continued to collect the data (almost daily) until 1994. She also kept weather records and newspaper cuttings for nearby Whitby from 1983 to 2004 (Figure 2). Her in-depth knowledge and understanding of the role of small-scale temperature variation on the shore coupled with collaboration with European colleagues on the European Commission-funded COST 647 Project on Coastal Benthic Ecology, Rosemary gained invaluable insights on geographical variation in the breeding cycles and recruitment (Lewis et al. 1982; Bowman and Lewis 1986). These invaluable data provide an excellent baseline for comparison with contemporary data collected during a time of rapid climate change.

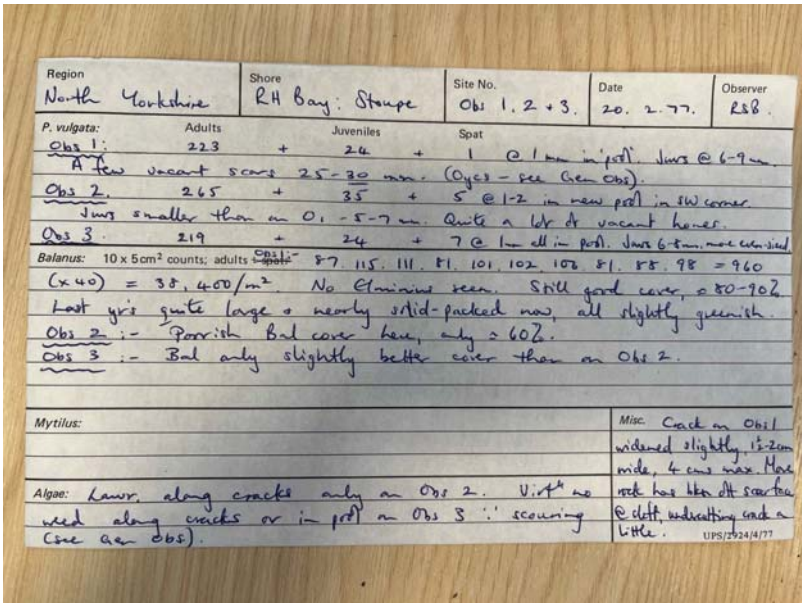

Figure 1. Example of data recording sheet showing the level of detail that was captured in fixed plots on the rocky shore at Robin Hood's Bay.

The last paper that Rosemary published was in 1986 (Bowman and Lewis 1986). She kept collecting data until the 1990s (biological) and 2000s (temperature, weather). On her passing in 2021, Rosemary's sister Penny kindly gifted her files to me. Despite having three excellent students working on the data over two consecutive summers, we have only managed to digitise a fraction of her data. Rosemary's data are a treasure and need to be properly curated and shared. We are currently working on publishing a number of datasets and papers.

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Other data archaeology and rescue efforts have been very successful. For instance, the MarClim (Marine Biodiversity and Climate Change) Project was established in 2001 to investigate changes that had occurred in rocky intertidal systems within the last 50 years around the UK. MarClim established a low-cost network of sites covering England, Wales and Scotland which provided subsequent annual updates to track how climate influences the marine biodiversity of the British Isles (e.g., Burrows et al. 2020; Mieszkowska et al. 2021).

Rosemary's data on limpets, other molluscs, and the wider data collected as part of the Rocky Shore Surveillance Group, and COST 647 Project on Coastal Benthic Ecology represent an ideal opportunity for a similar project to rescue data and revisit field sites. In an era of rapid global climate change and open data, it is of critical importance to look after the legacies of Rosemary Bowman and those who have gone before us. After all, we all know that our ability to see further is merely because we are standing on the shoulders of giants.

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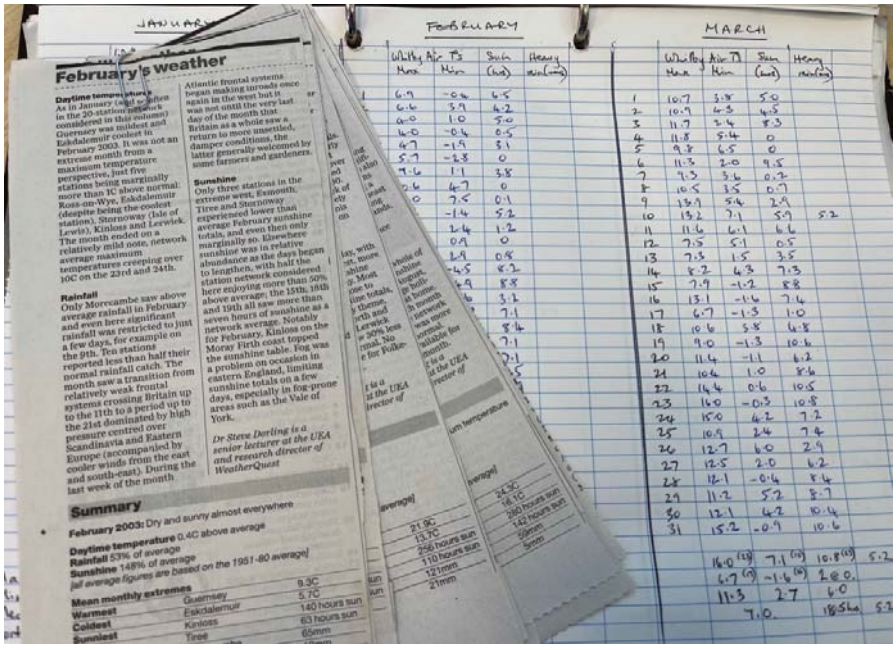

Figure 2. Example of temperature data recording sheet and newspaper cuttings of monthly weather reports.

TRAVEL GRANT REPORTS

Reducing successful shipworm larval settlement on wood that has been modified using furfurylation

Shipworm *Teredo navalis*' bivalve shell

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Thanks to an Early Career Research Grant from the Malacological Society of London, I was able to travel to the Institute of Marine Science (ISMAR-CNR) in Venice, Italy in June 2022, to complete a work placement assessing settlement attempts by the wood-boring bivalves on treated wood.

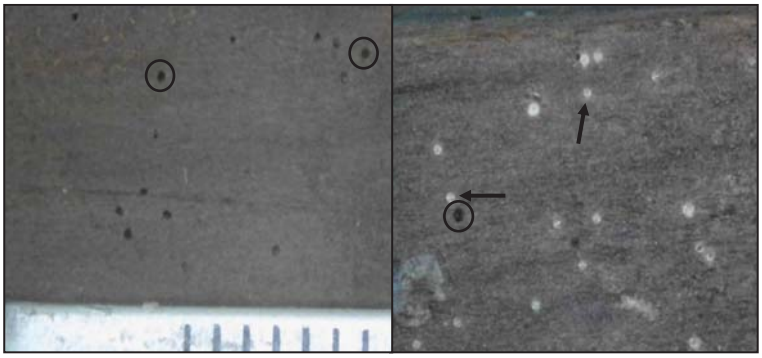
Teredinid bivalves, commonly known as shipworms, are aggressive attackers of wood in the marine environment, posing a particular risk to anthropogenic structures such as piers and sea defences. Their relatively large size (compared to crustacean wood-borers) and potential for rapid growth can result in damage to such structures that can amount to billions of pounds every year. It is therefore beneficial, in wood preservation technologies that are designed for marine use, if teredinids can be restricted at the early larval stage, before settlement and damage ever occur. Novel approaches to protecting wood in the marine environment are needed as restrictions by legislation in the EU, USA, UK and Australia, have limited the scope for the use of broad-spectrum biocides. Wood modification offers a promising alternative approach to protecting wood from marine wood borers, while also reducing environmental impacts from leaching of traditional treatments, such as CCA (chromated copper arsenate) and creosote. Processes of modification are evolving rapidly, so long-term testing needs to be supplemented by rapid lab and field testing methods in order to keep up with process development. The outline for assessing wood resistance to marine borers is set by the European Standard, EN275. However, the assessment is based on the percentage cover of adult animals observed on radiographs, which requires years of exposure in order to achieve comprehensive results. A rapid test monitoring larval settlement success can provide much faster initial results and allow for greater flexibility in modification processes and possibly act as a predictor of the long-term efficacy of commercial products.

Shipworm damage in experimental wood

Shipworm are prevalent in Venice due to their long history of maritime wood use, and the availability of shipworm larvae in the lagoon (in the late spring/early summer spawning season), provides an ideal environment to conduct rapid testing.

It was difficult to induce spawning in shipworm cultures that were reared in aquaria, so testing was instead conducted adjacent to EN275 test rigs that were already in operation in Venice, and that contained actively spawning adult shipworm. Small wood blocks (25mm x 20mm x 5mm) were cut from larger planks of wood that had been treated using a chemical modification known as furfurylation. Two treatments of furfurylated wood and an untreated control were deployed in June 2022, and assessed after 5, 10 and 15 weeks of exposure. Settlement attempts were identified via visible hemispherical indentations that were left by larvae that had failed to metamorphose and were counted manually. Any larvae that had successfully settled and metamorphosed produced a calcium carbonate deposit around the entrance of the bore hole and were also counted - these were classed as 'successful attempts'.

On treated wood, no successful settlement was observed until week 15 and this was only indicated by slightly larger entry holes that had begun to be covered by a calcareous deposit. Untreated control wood on the other hand were heavily infested by adult shipworm (seen by x-ray at week 10) and were terminated at week 15 due to the severity of attack. Fewer initial attempts were also made on the treated woods compared to the control.



Hemispherical bore holes from attempted shipworm larval settlement, examples circled. Metamorphosed larvae i.e., 'successful' settlement attempts, examples indicated by arrows. Scale 1mm.

View from the Arsenale di Venezia at the end of the work day.

Angiostrongylus malaysiensis in gastropod and rat population at recreational parks of Kuala Lumpur, Malaysia.

29th International Conference of the World Association for the Advancement of Veterinary Parasitology in Chennai (India), 20 – 24 August 2023

Suey Yee Low
Department of Veterinary Pathology & Microbiology, Faculty of Veterinary Medicine, Universiti Putra Malaysia.
Email: eulynnlow96@gmail.com

Photo booth of WAAVP 2023

The 29th International Conference of the World Association for the Advancement of Veterinary Parasitology (WAAVP) was held from August 20 to 24, 2023, in Chennai, India. The conference is organized triennially by WAAVP. The latter serves as a premier global platform for researchers in the field of veterinary parasitology to convene and deliberate upon the most pressing issues concerning parasites and their impact on both animal and human health. The theme of this year's conference is *Parasites; Global Impacts, Local Solutions*. As a first-time attendee at an international conference, this experience was enlightening, informative and unforgettable.

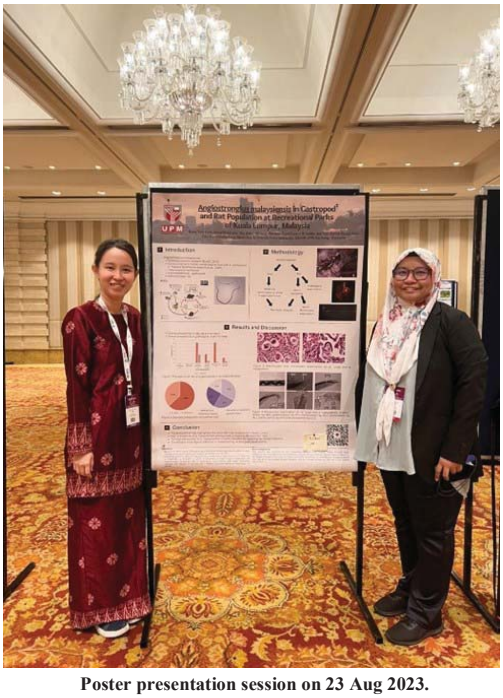
The conference started with two keynote lectures delivered by experts that provided deep insights into the current state of knowledge and ongoing research in the field of veterinary parasitology.

One of the most exciting moments during the conference was the opportunity to present my own work through a poster presentation: "*Angiostrongylus malaysiensis* in Gastropod and Rat Population at Recreational Parks of Kuala Lumpur, Malaysia." I got the opportunity to engage with fellow researchers who shared a similar fascination with the *Angiostrongylus* worm. The discussions with others provided me with fresh insights and perspectives that I had not previously considered.

In addition to the scientific sessions, the conference facilitated an environment for networking and collaboration through yoga sessions and fun runs. It was very interesting to interact with researchers from different geographical backgrounds. This connection not only expanded my professional network, but also fostered lifelong friendships.

In conclusion, the 29th International Conference of WAAVP was a pivotal chapter in my academic journey. I am very grateful for the opportunity to attend this conference, and I owe a debt of gratitude to the Malacological Society for their generous travel grant that made this experience possible. This grant not only eased the financial burden of attending an international event, but also served as encouragement, strengthened my commitment to academic pursuits and is driving me further toward my academic goals. The support extended by the Malacological Society has rekindled my motivation to embark on a PhD journey with new insights and determination.


Some participants from different countries.


Poster presentation session on 23 Aug 2023.

89th annual meeting of American Malacological Society 2023

Connectivity patterns of invasive snails *Callinina georgiana* and *Heterogen japonica*

W.A.N.U Nimanthi Abeyrathna
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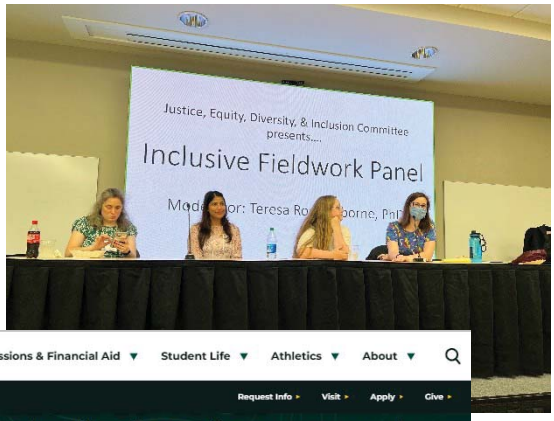
Email: abeyranu@clarkson.edu

In the spring of 2023, I was looking for travel support to attend the 89th annual meeting of American Malacological Society 2023. As a PhD candidate, I was researching the connectivity patterns of invasive snails *Callinina georgiana* and *Heterogen japonica* and I gathered a lot of data to present at a conference. Earlier in my PhD journey, travel for conferences was impossible due to COVID, and this was the second-ever conference that I wanted to attend in my PhD studies. Funding support for this conference was not fully sorted from elsewhere and through this award from the Malacological Society of London, I was able to go to Alabama and present my work about invasive snails. I was able to later join a field trip which was very informative and we went to see Alabama's freshwater species in the Living River. I was surprised to see how biodiverse the river in Alabama compared to what I see in the rivers in New York.

Additionally, I shared my experiences as a field ecologist on a panel that centered on *'Women and Safe Fieldwork.*' As a panelist, I discussed the challenges I faced as an international student during fieldwork expeditions, shedding light on cultural adjustments. The panel delved into various themes, including menstruation, lactation, menopause, as well as issues of racial and gender discrimination in field settings. Our discussions encompassed strategies for cultivating safe and inclusive fieldwork environments, along with protocols for responding to emergencies. A detailed account of my participation in this panel was featured in a letter posted on the Clarkson University website (Clarkson University PhD Student Serves as Panelist at American Malacological Society Annual Meeting).

The support I received from The London Malacological Society profoundly impacted my journey. Without their assistance, these accomplishments would have remained beyond my reach.

With an elephants' ear mussel



Taking part in the panel discussion

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Panelist at American Malacological Society Annual Meeting

AUGUST 11, 2023

Nimanthi Abeyrathna, an Interdisciplinary Bioscience and Biotechnology PhD student at Clarkson University, recently served as a panelist in a discussion on inclusive fieldwork and field courses hosted by the American Malacological Society's (AMS) Justice, Equity, Diversity, and Inclusion (JEDI) Committee.

AMS covered Abeyrathna's registration for the conference, and she also was awarded a travel grant by the London Malacological Society to attend the event.

The panel was held at the American Malacological Society's annual meeting, in Alabama on Aug. 3. Abeyrathna said topics covered during the panel ranged from general field work safety to discussions on women in field work and racial, cultural and gender dynamics and issues.

"There was lots of attention on the topics that we want people to know like, pregnancy, menstruation and menopause when doing field work," Abeyrathna said. "Emotional support when away from loved ones, finding mental stability in a field work station, what do you do in an emergency? What do you do if you encounter hunters in your field station? Or situations involving entering public lands and private lands and how to think about the safety first and then about sample collection."

Abeyrathna said she gained knowledge on several topics, including how to react in emergency medical situations and how to prepare an inclusive field station by offering things like vegetarian meals or accommodating other sensitivities. The conference also underlined for her the importance of discussing hurdles faced by women in the field more prominently.

"Pregnancy, lactation, menstruation, and menopause are challenges in the field," Abeyrathna explained. "We need to discuss matters openly."

RELATED LINKS

Campus Events Calendar

Academic Calendar

Visit Clarkson

5th Asia Pacific Coral Reef Symposium (APCRS) 2023 – Singapore

Developing a nationwide baseline of giant clam population densities across the coral reefs of Thailand

Matthias Desmolles
Aow Thai Marine Ecology Center (ATMEC), Bangkok, Thailand

This travel to Singapore was the occasion for our team to present the advances on our work concerning giant clams in the Thai waters. For this 5th version of APCRS, we had the excellent surprise of a full-day session dedicated to giant clams all across the Indo-Pacific waters. This session happened thanks to the work of Dr. Mei Lin Neo who was part of the organizing committee.

I had the privilege to show the survey work of our team to many tridacnids experts, especially since our session was fully dedicated to population assessments. Thus allowing us to compare our findings with surveys performed in the Philippines, Malaysia and Singapore. One of the biggest conclusion of that session was the necessity of such population monitoring, helping to review the IUCN status of giant clams in the Indo-Pacific. This status hasn't been updated since 1996, and clams are still in CITES Annex II (not a major concern), even if, in some parts of the Coral Triangle, some species like *T. crocea* or *T. gigas* have been widely wiped out.

On a non-« malacological » note, the whole Symposium was a great experience, and a first for me. I never had the opportunity to present my work in marine biology to academics and this was an eye-opening experience. I met many specialists and had great discussions about research fields I had never heard of! For that, I will always be thankful to the Malacological Society for offering me such an opportunity.

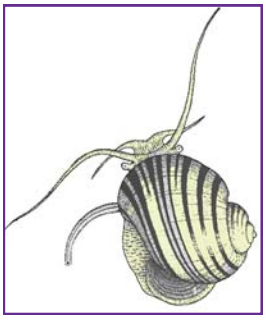
Overall, it was an outstanding experience. The conference involved more than 800 attendants from 40 countries, 450 talks, 200 posters, a huge diversity of subjects, many prospects for future research and a memorable banquet (the organizing committee clearly underestimated marine biologists party potential). Thanks a lot MalacSoc!

Molluscan Forum

Forthcoming meetings

The Malacological Society of London
HTTP://WWW.MALACSOC.ORG.UK

Molluscan Forum



Thursday 16th November 2023
9.00 – 6.30
Flett Lecture Theatre
Natural History Museum, London
Organisers

CALL FOR REGISTRATIONS AND PAPERS

This informal, annual, and successful meeting is designed to bring together people starting their research on molluscs, to give them the opportunity to present and discuss their work and to compare notes on methods and problems.

Attendance at the Molluscan Forum is open to all, but presenters should be **research students, post-doctoral researchers, undergraduate students** starting molluscan projects, and **amateurs** engaged in substantial projects that have not yet been published. Any topic related to molluscs is acceptable: palaeontological, physiological, behavioural, ecological, systematic, morphological, cellular, or molecular.

Talks (~12 minutes), quick fire talks (~3 minutes) or posters may be offered. They need not be polished accounts of completed work; descriptions of new methods, work in progress, and appeals for assistance with unsolved problems are equally acceptable.

With a hybrid format this year we will have two virtual sessions (with limited space) to give those unable to travel to the UK a chance to present their work. Posters will all be presented in person.

THERE IS **NO** REGISTRATION FEE.

Enquiries and registrations to:
events@malacsoc.org.uk

Non-presenters:
Virtual attendance of talk sessions for non-presenters will be possible (poster sessions will be in person), so please indicate whether you will be attending in person or virtually. Please let us know you will be coming so that we can estimate numbers.

CONTINUED >

Molluscan Forum, Thursday 16th November 2023
9.00 – 6.30
Flett Lecture Theatre, Natural History Museum, London

REGISTRATION FORM

Return before 15th September 2023, by email to:

events@malacsoc.org.uk

Name.....

Institute.....

.....

Email.....

Status: PhD student / Masters student / Undergraduate / Post-doctoral researcher / amateur (delete as appropriate)

'Other' (please state) ……..

I wish to give a talk (~12minutes)/ quick fire talk (3 minutes) / poster
(delete as appropriate) entitled:

.....

.....

I would like to present in person / remotely (talks only). Delete as appropriate.

IMPORTANT
Please attach, as a Microsoft Word attachment, an abstract of not more than 350 words, TOGETHER WITH TWO .JPG IMAGES IN SUPPORT OF THE ABSTRACT. Abstracts and images of accepted contributions will be published in the Society's online bulletin which is called *The Malacologist*. *The Malacologist* has an ISSN number and is published and archived on the website of the MSL.

Posters should be roll-ups or mounted on stiff cards, and should require no more than a 1 metre x 1 metre display area. They will be mounted on boards (velcro supplied).

If you are unable to get financial support from elsewhere (students and amateurs only) and need assistance with travel costs, please enter here the cost of the cheapest possible public transport return fare to London.

£.....

Funding is not guaranteed but we endeavour to support as many presenters as possible. Late registrations may miss the opportunity for financial support. The support will be limited, so funding from elsewhere should be sought first. A provisional programme will be sent out late October.

CONTINUED >

>CONTINUED

Abstract submission

Abstracts submitted for the Molluscan Forum should be sent as Microsoft Word files.
Please use the following format:

Title (12pt, centred)
<blank line>
Authors (10 pt, centred, presenting author underlined; use superscript numbers to indicate institutional affiliation)
<blank line>
Institutions (10pt, centred; in this order: Number (superscript), Department, Institution, City, Country)
Presenting Author email
<blank line>
Abstract (11pt, no indentation, justified, 350 words maximum)

EXAMPLE ABSTRACT

The Geographic Scale of Speciation in *Stramonita* (Neogastropoda: Muricidae)

Martine Claremont[1,2], Suzanne T. Williams[1], Timothy G. Barraclough[2], and David G. Reid[1]

[1]Department of Zoology, Natural History Museum, London, UK
[2]Department of Biology, Imperial College London, Berkshire, UK
Email: m.claremont@nhm.ac.uk

Stramonita is a relatively small, well-defined genus of muricid marine gastropods limited to the tropical Eastern Pacific and the Atlantic. The type species, *S. haemastoma*, is known to have teleplanic larvae and is estimated to remain in the water column for several weeks. *Stramonita haemastoma* shows regional variation, and this has led to the recognition of five geographical subspecies: *S. h. haemastoma*, from the Mediterranean and Eastern Atlantic to Brazil, *S. h. floridiana*, on the east coast of Florida and in the Eastern Caribbean, *S. h. caniculata* on the west coast of Florida and the Gulf of Mexico, *S. h. rustica* in the Western Caribbean and *S. h. biserialis* in the Eastern Pacific. The protoconch has been shown to be similar across the *S. haemastoma* complex, implying that all subspecies have equally long lived larvae. Within these subspecies, cryptic variation is suspected. For example, *S. h. biserialis* is suggested to be differentiated North/South on a small scale. In the presence of teleplanic larvae, speciation on such a small scale seems paradoxical. Various explanations for this paradox are possible. Actual (or realized) dispersal of *Stramonita* species may be more limited than presently believed, leading to allopatric differentiation. Alternatively, morphological differentiation may not be a reliable indicator of genetic differentiation, and *S. haemastoma* (*sensu lato*) might indeed prove to be a single taxa. It is also possible that ecological speciation could result in geographical speciation on a small scale in the presence of wide dispersal. My results suggest that five species of *Stramonita* are present in the Caribbean, at least three of which occur sympatrically. Gene flow is maintained between Caribbean and Mediterranean populations in at least one species, while no genetic differentiation was found along the Eastern Pacific coast. The implications of these results are discussed.

NOTE THAT ABSTRACTS ARE PUBLISHED IN *THE MALACOLOGIST* WHICH IS THE BULLETIN OF THE SOCIETY AND HAS AN ISSN NUMBER.

BEFORE THE FORUM, PLEASE EMAIL TO THE EDITOR TWO IMAGES TO ACCOMPANY YOUR ABSTRACT. TRY TO MAKE THESE IMAGES ONES THAT YOU WOULD NOT USE IN AN EVENTUAL FULL PAPER.
EDITOR georges.dussart@canterbury.ac.uk

Grants and Awards

The Research Awards Scheme was established to commemorate the Society's Centenary in 1993. Under this scheme, the Society gives awards to support research on molluscs that is probably to lead to publication. The closing date for applications each year is 15th December. Grants are preferentially conferred on students and researchers without regard to nationality or membership of the Society. Preference is also given to discrete research projects that fall within the subject areas covered by the Society's *Journal of Molluscan Studies*. Applications will be assessed by scientific merit, value of the project and for student applicants, the extent to which the research will benefit the applicant's scientific aspirations. The successful applicants will be notified by 31st March and announced at the Annual General Meeting. Awardees are encouraged to publish their work in the ***Journal of Molluscan Studies*** (full papers) or ***The Malacologist*** (travel award reports, research award reports, news of ongoing research etc) as appropriate.

Early Career Research grants

Eligibility is restricted to those investigators at the outset of their independent scientific career. Applications must therefore be 1) postgraduate students, 2) within five years of being awarded their PhD (adjustable for career breaks), or 3) independent researchers not having a PhD. Early Career Research Grants will only be awarded to individuals twice, but not within 3 years of receiving a first award. From December 2021, the Society also offers additional awards, under its Global Participation Postgraduate Student Scheme, to a) applicants from developing and transition countries (as according to the UN), and b) UK/EU applicants from Black, Asian, or any other underrepresented ethnic background (see next page for application procedures)

Sir Charles Maurice Yonge Award

There is no application process for Sir Charles Maurice Yonge Awards. These awards are given for the best Travel Award application on bivalves. The award is to support attendance at an international meeting (not including the Molluscan Forum). Authors of exceptional studies on bivalves in *the Journal of Molluscan Studies* may on occasion also be given this award. The Editor will nominate such papers as he/she sees fit. The award covers the costs requested in a Travel Award, or for open access publication of the paper. Members of the Society will also receive a personal cash prize of £300. Non-members will receive a personal cash prize of £250 plus one year's membership to the Society. If a paper is multi-authored, the award will be made to the corresponding author.

Senior Research Awards

These are aimed at established researchers in professional positions, but without regard to nationality. Applicants for Senior Research Awards must be members of the Malacological Society of London. The Society currently awards up to five Senior Research Grants per year, each with a value of up to £1,500, to support research on molluscs that is probably to lead to publication. The maximum amount available should not be considered as a 'target'; rather requests should reflect the research that is proposed. The grants are reviewed by a Reviewers Panel including both Council and non-Council members invited for that purpose.

Travel Grants

Travel Awards are available as bursaries to support attendance at a conference or workshop relevant to malacology. Grants are preferentially conferred on students but researchers without professional positions may also apply. The maximum amount for one of these awards is £500 for Society members and £300 for non-members. Preference will be given to members of the Society. There are two closing dates each year, The deadlines are 1st March, for travel scheduled between 1st June and 30th November, and 1st September for travel scheduled between 1st December and 31st May.

For further information, guidance notes and to access the application form see here - http://malacsoc.org.uk/awards-and-grants/travel-grants

Annual Award

This Award is made each year for an exceptionally promising initial contribution to the study of molluscs. This is often a thesis or collection of publications. The value of the Award is £500. Candidates need not be a member of the Society but must be nominated by a member. There is no application form: the nominating member should send the material for evaluation with a covering letter or letter of support to the Honorary Awards Secretary. The closing date each year is 15th December. The winner(s) will be notified by 31st March, and announced at the Annual General Meeting.

Applications

Applications for Research Awards and Travel Grants should be sent to the
Honorary Awards Secretary, Lauren Sumner-Rooney,
Museum für Naturkunde, Invalidenstrasse 43, Berlin 10115, Germany.
For further information, guidance notes and to access the grant application form see http://malacsoc.org.uk/awards-and-grants/research-grants

Global Participation Postgraduate Student Scheme

This is a new MSL initiative to help support more students from across the world in their malacological studies. The scheme will run every year, so each year ten new students will be given free membership for a 3 year period. So, in 2023 there will be 10 students, in 2024 there will be 20 and in 2025 and thereafter there will be 30.

We are offering 10 students each year free membership to *The Malacological Society of London* for a period of 3 years. Students who are studying a postgraduate malacology-related course in countries designated 'developing economies' are invited to apply for this award with the support of their supervisor. Applications are open immediately and will close when all 10 memberships have been allocated. Membership of the first round starting on 1st January 2023 and ending on 31st December 2025.

The scheme will run on a yearly basis and applications will open again next autumn.
Successful candidates will benefit from:

- online access to entire archive of *Journal of Molluscan Studies* (back to 1893)
- electronic delivery of Society's bulletin, *The Malacologist*
- access to a higher rate of travel grant
- regular communication from MSL about the Society's themed meetings and the annual Molluscan Forum

Application procedure:
Please send applications and proof of course registration to the Membership Secretary: membership@malacsoc.org.uk

Selection criteria:
Applicants must fulfil the conditions stated below and will be selected on a first-come basis.

Conditions:

- Students must be registered for their postgraduate course in a country designated as a 'developing economy'.
- The course must have a strong malacological focus.
- Students must have the support of their supervisor and must send proof of course registration with their application and for each membership year.
- Membership will last for a maximum of 3 years, not the duration of a course, and an individual can only receive the award once.
- If there is a gap in a student's study their membership will stop, but if a course is upgraded (e.g., from MSc to PhD) and the student's study is continuous, then the membership can continue for the full duration of the scheme.
- Students on part-time courses and those undertaking course work-only courses can also apply.

Simon Lia cartoon in the Guardian 14 May 2023

Malacological Society of London – Subscription and Membership

Objects

The objects of the Society are to advance education and research for the public benefit by the study of molluscs from both pure and applied aspects. We welcome as members all who are interested in the scientific study of molluscs. There are Ordinary Members, Student Members and Honorary Members. Members are entitled to receive a digital copy of the *Journal of Molluscan Studies* and such circulars as may be issued during their membership. The Society's website is at:
http://www.malacsoc.org.uk

Publications

The Society has a continuous record of publishing important scientific papers on molluscs in the *Proceedings*, which evolved with Volume 42 into the *Journal of Molluscan Studies*. The *Journal* is published in annual volumes consisting of four parts which are available on -line by members and student members. The Society no longer produces paper copies of the Journal. Members also receive access to *The Malacologist*, which is the bulletin of the Society, issued twice a year, in February and August. *The Malacologist* is published online on the website of the Society.

Meetings and articles

In addition to traditional research on molluscan biology, physiological, chemical, molecular techniques are amongst the topics considered for discussion meetings and papers for publication in future volumes of the *Journal*.

Subscriptions

Membership subscriptions are valid from **1st January** for a single calendar year.

Membership fee structure

Ordinary Members: Journal on-line only £45
Student Members: Journal on-line only £25

Methods of Payment

New Members:
To join the Society for the first time please fill in the Membership Form on the MSL website and make your payment using a Credit or Debit Card (Mastercard, Visa, American Express):
https://malacsoc.org.uk/membership-form/

***Existing Members*:**
If you already have an account on the MSL website please **login** to renew your membership and make your payment using a Credit or Debit Card (Mastercard, Visa, American Express).

OR

If you have already set up a standing order you may continue to pay in this way. We do not encourage members who have a MSL account on the website, or any new members, to set up a standing order.

Institutional Subscriptions to the Journal

Enquiries should be addressed directly to Oxford University Press, Walton Street, Oxford OX2 6DP, U.K.

For any membership queries please contact the Membership Secretary: membership@malacsoc.org.uk

*NEW * Broadening Access Membership Scheme

We are excited to launch a new initiative to help support more postgraduate students from countries listed as developing economies in their malacological studies.

We are offering **10 postgraduate students each year free membership** to *The Malacological Society of London* for a period of 3 years under the new Broadening Access Membership Scheme (BAMS). Students who are studying a postgraduate malacology-related course in countries designated 'developing economies' are invited to apply for this award with the support of their supervisor. Applications open each autumn and will close when all 10 memberships have been allocated.

Successful candidates will benefit from:

- online access to entire archive of *Journal of Molluscan Studies* (back to 1893)
- electronic delivery of Society's bulletin, *The Malacologist*
- access to a higher rate of travel grant
- regular communication from MSL about the Society's themed meetings and the annual Molluscan Forum

Application procedure:
To find out more about the scheme, who is eligible and how to apply, please go to the following page on our website: https://malacsoc.org.uk/developing-economies-membership-scheme/

REGISTERED CHARITY NUMBER: 275980

REPORT OF THE TRUSTEES AND UNAUDITED FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2022 FOR THE MALACOLOGICAL SOCIETY OF LONDON

Staffords
Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
Oakington Road, Girton
CAMBRIDGE
Cambridgeshire
CB3 0QH

THE MALACOLOGICAL SOCIETY OF LONDON

CONTENTS OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2022

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2022

The trustees present their report with the financial statements of the charity for the year ended 31 December 2021. The trustees have adopted the provisions of the Charities SORP (FRS102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

STRUCTURE, GOVERNANCE AND MANAGEMENT

Governing document

The charity is controlled by its governing document, a deed of trust, and constitutes an unincorporated charity.

The governing document is continually reviewed following its original adoption on 17 May 1978, with the current operative revision of the governing document being that amended on 28 April 2005.

Recruitment and appointment of new trustees

Nominations for Council (the board of related party) from members must be proposed and seconded and in the hands of the Secretary by December 31st. Members at the AGM 2016 proposed and seconded that only the Society's President and Officers (Treasurer, Secretary, Membership Secretary, Awards Secretary) are forming the board of trustees. It shall be the duty of Council to nominate members for election to the offices of President, Treasurer, Secretary, Membership Secretary, Editor of the Journal, Editor of the Bulletin, Archivist, Web Manager, and Awards Secretary, and for the vacancies in the Council caused by annual retirement. Nominations from the members and from Council shall be submitted to the Society with the notice convening the Annual General Meeting which shall be sent to every member of the Society not less than fourteen days before the Meeting.

In the case of a vacancy arising in any office of the Society, or in the Council, other than by way of resignation or retirement in the Annual General Meeting, the Council shall have power to appoint a temporary Council member to that vacancy until the next Annual General Meeting.

Risk management

The trustees have a duty to identify and review the risks to which the charity is exposed and to ensure appropriate controls are in place to provide reasonable assurance against fraud and error.

In particular:

(a) Admission fees and annual subscriptions shall be such sums as may be determined by a Special General Meeting convened under Rule VI(c), or at the Annual General Meeting.

(b) Subscriptions shall be due on the 1st of January in each year; but in the case of a new member, immediately after election. Members elected during the months of November and December, however, shall not be required to pay for the year in which they are elected.

(c) Any member whose current subscription has not been received in full by 31 January shall be reminded of the arrears in subscription and be informed that despatch of the Journal is suspended until the arrears are paid. No member whose subscription is twelve months in arrears shall be entitled to any of the privileges of the Society, and any member whose subscription is two years in arrears shall cease to be a member of the Society, unless the Council decide otherwise.

(d) The Council shall revise and publicise the conditions of the Society's awards and grants from time to time.

(e) For the purpose of legal protection of the property of the Society, all funds, books and other property shall be declared vested in Council as the Society's Trustees.

(f) The Council shall cause to be kept Minutes of Council and Society Meetings and books of account in respect of all receipts, payments, assets and liabilities. Accounts shall be presented to each Annual General Meeting for approval by members and such accounts shall be audited or independently examined as appropriate.

OBJECTIVES AND ACTIVITIES

Objectives and aims

The governing document contains the following in relation to the objective of the charity:

The objects of the Society are to advance education, research and learning for the public benefit in the study of molluscs from both pure and applied aspects. In furtherance of these objects, but not further or otherwise, the Society shall have the following powers:

(a) To promote and co-ordinate meetings and symposia,

(b) To promote and co-ordinate research both pure and applied;

(c) To provide for the worldwide dissemination of the useful results of such research by publication of the Journal of Molluscan Studies;

(d) To award prizes to outstanding students in the field of molluscan biology;

(e) To award research grants to individuals which will advance the study of molluscan biology;

(f) To do all such things as will further the objects of the Society.

Significant activities

In 2022 the Malacological Society of London held a virtual AGM meeting with the online symposium “Molluscan Tropical Biodiversity”, and the annual Molluscan Forum for Young Scientists was also held as a hybrid meeting with online and in-person presentations. The Society published the members' bulletin "The Malacologist" and in cooperation with Oxford University Press "Journal of Molluscan Studies".

Public benefit

The charity's objects are for the public benefit because increasing public knowledge is required as they form an important part of the global biodiversity and ecosystem stability which can have effects on human health and are a human food source.

ACHIEVEMENT AND PERFORMANCE

Charitable activities

In 2022 the main charitable activities were the funding of ten ECR and two SCR research projects, of which all were claimed, (total cost of £17,534), the support of three students to attend conferences and eleven students to attend the Molluscan Forum (£2,840), and support to the organization of two malacological conferences (£3,522).

FINANCIAL REVIEW

The finances of the Malacological Society have been impacted during 2022 by UK’s challenging economy ad stock market with an overall loss of £30,052 This loss is explained by significant losses in the Investment funds.

Our investments had an overall loss of £43,663 (comparing market value at 31 December 2022 with market value at 31 December 2021), with the COIF Investment Fund making a loss of £29,780 and the COIF Fixed Interest Fund a loss of £13,883. During 2022, no funds were transferred from the current account to savings accounts.

Separately, the profit-share from the publication of the Journal of Molluscan Studies in 2022 provided the Society with most of its income contributing £43,431, compared to £48,035 in 2021. This year OUP did not provide information on sales of the digital archives. The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal.

In 2022, more funds were used for research awards, being £17,534 in 2022 compared to £13,948 in 2021, and spending on travel and meeting related spending, significantly dropped during the pandemic, increased to pre-pandemic levels. The Society (MSL) spent more money in 2022 compared to 2021, this was mainly based on more expenses paid for research, travel and meeting awards.

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2021

REFERENCE AND ADMINISTRATIVE DETAILS

Registered Charity number
275980

Principal address
c/o British Antarctic Survey
High Cross
Madingley Road
CAMBRIDGE
CB3 0ET

Trustees

J Ablett	President
Dr H Wood	Membership Secretary
Dr K Linse	Hon. Treasurer
Dr Debbie Wall Palmer	Hon. Secretary
Dr Lauren Sumner Rooney	Awards Officer

Independent examiner
Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Approved by order of the board of trustees on ..... and signed on its behalf by:

.....
Jonathan Ablett - Trustee

INDEPENDENT EXAMINER'S REPORT TO THE TRUSTEES OF THE MALACOLOGICAL SOCIETY OF LONDON

I report on the accounts for the year ended 31 December 2022 set out on pages five to ten.

Respective responsibilities of trustees and examiner
The charity's trustees are responsible for the preparation of the accounts. The charity's trustees consider that an audit is not required for this year (under Section 144(2) of the Charities Act 2011 (the 2011 Act)) and that an independent examination is required.

It is my responsibility to:

- examine the accounts under Section 145 of the 2011 Act
- to follow the procedures laid down in the General Directions given by the Charity Commission (under Section 145(5)(b) of the 2011 Act); and
- to state whether particular matters have come to my attention.

Basis of the independent examiner's report
My examination was carried out in accordance with the General Directions given by the Charity Commission. An examination includes a review of the accounting records kept by the charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and seeking explanations from you as trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit, and consequently no opinion is given as to whether the accounts present a 'true and fair view ' and the report is limited to those matters set out in the statements below.

Independent examiner's statement
In connection with my examination, no matter has come to my attention:

(1) which gives me reasonable cause to believe that, in any material respect, the requirements

- to keep accounting records in accordance with Section 130 of the 2011 Act; and
- to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the 2011 Act

have not been met; or

(2) to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Date: .....

The Malacological Society of London

Statement of Financial acitivities (incorporating an income and expenditure account) for the year ended 31st December 2022

Note		TOTAL 2022	TOTAL 2021
	INCOMING RESOURCES		
	Income from Activities of the Charity		
	Members' Subscriptions: Current Year	3,035	2,205
	Collection of Subscription Arrears		-
4	OUP: Income from Journal Publication	43,431	48,035
2	Income from sale of Digital Archive	-	2,454
	Sundry Income	33	105
	Donations	-	-
	Income from Investments	-	
3	Interest	21	-
3	Dividends	2,813	3,181
	TOTAL INCOMING RESOURCES	**49,333**	**55,980**
	RESOURCES USED		
	Awards		
	Annual Award	500	-
	WCM Award	200	-
7	Research Awards (Early career & Senior)	17,534	13,948
	Malacological meeting awards	3,523	-
		-	-
7	Travel Bursaries for conferences	1,500	300
5,6	Travel awards: AGM	-	-
5,6	Travel awards: Forum	1,340	-
		24,597	**14,248**
	Directly Relating to Work of Charity		
4	Journal expenses (member fees)	2,492	4,524
4	Journal colour plates	-	1,080
4	Journal editor expenses, incl meetings	2,100	1,624
5	Malacologist Expenses	-	286
6	Meeting Expenses	2,900	300
	Independent examiners expenses	1,248	1,188
5,6	Council Meeting travel expenses	617	-
	Web sites	560	-
5	Postage, Printing & Stationary	-	446
	Charges for cc subscription collection	58	36
	Bank charges	404	132
	Sundries	748	-
	Total	**35,723**	**23,863**
	NET INCOME	**13,610**	**32,117**
8	LOSS/GAIN ON REVALUATION OF FIXED ASSETS	- 43,663	41,202
	NET MOVEMENT IN FUNDS	- 30,052	73,319
	TOTAL FUNDS BROUGHT FORWARD	516,629	443,310
	TOTAL FUNDS CARRIED FORWARD	**486,577**	**516,629**

CONTINUING OPERATIONS

All income and expenditure has arisen from continuing activities.

The Malacological Society of London

Balance Sheet at 31 December 2022

Note		2022	2021
		£	£
	FIXED ASSETS	**398,158**	**441,821**
8	Tangible Assets		
	CURRENT ASSESTS		
11	Debtor	-	-
9	Cash at Banks	101,667	87,996
10	CREDITORS: (Amounts falling due within one year)	- 13,248	- 13,188
	NET CURRENT ASSETS	**88,419**	**74,808**
	TOTAL NET ASSETS	**486,577**	**516,629**
	FUNDS		
	Unrestricted (Designated):		
11	Annual Award Fund	6,500	6,500
11	CM Yonge Award Fund	9,250	9,250
11	Centenary Research Award Fund	80,000	80,000
		95,750	95,750
11	General reserve Fund	390,827	420,879
	TOTAL FUNDS	**486,577**	**516,629**

Katrin Linse
Honorary Treasurer & Trustee

Dated

Jonathan Ablett
President & Trustee

Dated

The Malacological Society of London

Notes to the Financial Statements for the year ended 31st December 2022

1. ACCOUNTING POLICIES

Basis of Preparing the Financial Statements

The financial statements have been prepared in accordance with the Charities SORP (FRS 102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

- The SORP normally requires a columnar fomat, in this entities case the trustees' view is this is not appropriate as there are neither restricted funds nor endowment funds and so all of the activity in the year would fall within the unrestricted fund column.

Accounting Convention

The financial statements have been preprared under the historical cost convention, except for those items described immediately below.

- The historic cost basis of accounting is used except for investments, which have been included at their market value where readily available at the yearend date.

Going concern

The Trustees consider that there are no material uncertainties about the charity's ability to continue as a going concern.

Reconciliation with previously Generally Accepted Accounting Practice

In preparing the accounts, the trustees have considered whether in applying the accounting policies required by FRS102 and the Charities SORP FRS 102 the reinstatement of comparative items was required. In the case of this charity, no changes were made.

Fund accounting

- The Society funds, including funds available for awards, are not subject to any restrictions regarding their use, and are available to be used for the general purposes of the Charity. Consequently they are classified as 'Designated Funds'.

Taxation

- The charity is exempt from tax on its charitable activities.

Significant judgements

Apart from those judgements involving estimations, the management has not made any judgements in the process of applying the entity's accounting policies that have significant effect on the amounts recognised in the accounts. There are no key assumptions concerning the future or other key sources or estimation uncertainty at the reporting date that have significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next reporting period.

Financial reporting standard 102 - reduced disclosure exemption

The charity has taken advantage of the following disclosure exemption in preparing these financial statements, as permitted by FRS 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland':

- the requirements of Section 7 Statement of Cash Flows

Resources Expended

Expenditure is accounted for on an accruals basis and has been classified under headings that aggregate all cost related to the category. Where costs cannot be directly attributed to particular headings they have been allocated to activities on a basis consistent with the use of resources.

Incoming Resources

All income is recognised in the Statement of Financial Activities once the charity has entitlement to the funds, it is probable that the income will be received and the amount can be measured reliably.

Foreign currencies

- Asessts and liabilities in foreign currencies are translated into sterling at the rates of exchange ruling at the balance sheet date. Transactions in foreign currencies are tranlated into sterling at the rates of exchange ruling at the date of transaction. Exchange differences are taken into account in arriving at the operating result.

Incoming Resources and Resources used

· Subscriptions for annual membership are treated as follows:

Pre-paid in prior year	Liabilities
Paid in current year	Incoming Resource: subscriptions
Unpaid at 31st December	Not included in accounts. No debtor
Subsequently recieved	Incoming Resource: collection of subscriptions in arrears

· The costs of the Society Journal and supplements are written off in the year of initial distribution.

· The Profit Share from Oxford Journals is included in the year of receipt and not accrued.
The amount of Profit Share cannot be determined accurately by OUP until after the Society's AGM.

2. SALE OF THE DIGITAL ARCHIVE BY OUP

Since 2010 the sale of the digital archives by OUP has generated a windfall profit of £13,969 in 2010, £9,284 in 2011, £7,299 in 2012, £10,068 in 2013, £7,827 in 2014, £10,590 in 2015, £2,805 in 2016, £10,429 in 2017, £4,238 in 2018, £1,352 in 2019, and £506 in 2020.

3. INTERESTS & DIVIDENDS

Income has been derived from the following sources and has been applied to funds as indicated:

		2022	2021
		£	£
Sources	COIF Deposit Fund Interest	-	-
	COIF Fixed Interest Fund Dividend	2,813	3,181
	COIF Investment Fund Dividend		
		2,813	**3,181**
Beneficiary	Revenue Fund	893	1,010
	Annual Award Fund	147	166
	CM Yonge Award Fund	207	234
	Research Grants other Funds	1,566	1,771
		2,813	**3,181**

4. JOURNAL The surplus resulting from publication of the Journal is as follows

	2022	2021
	£	£
Profit Share from OUP	43,431	50,489
Less: sales of digital archives	-	- 2,454
Profit Share from OUP re Journal	**43,431**	**48,035**
Less:printing costs provisioning	- 12,000	- 12,000
plates	-	- 1,080
Editor & CM meeting expenses	- 2,100	- 1,624
Under/over-provision in previous year	9,508	7,476
Surplus on publication of the Journal	**38,839**	**40,807**

5. RELATED PARTY TRANSACTIONS AND TRUSTEES' EXPENSES

No Trustee or Council Member has recieved any renumeration during the current or previous year. Expenses paid by Trustees and Council Members on behalf of the Society have been reimbursed during the current year as follows.

Trustee	Date	£	Reason
Raheem	04.02.22	844.71	JMS edits
Raheem	04.02.22	90.00	Sub refund
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Goulding was recepient of travel award application in January 2022 for August 2022 travel prior to joining Council as the ECR representative.

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The following costs have been incurred on meetings for the Society:

		2022	2021
		£	£
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	General	-	-
	Dinner	-	-
	Zoom	91	14
	Webinar	-	134
Forum:	Travel	1,340	-
	Reception drinks	-	-
	Zoom	226	92
	Adobe	-	30
	Benugo	2,809	-
Council:	Travel	391	-
	Zoom (Feb/March)	-	29
		4,857	**300**

7. GRANTS AND AWARDS TO INSTITUTIONS

Although grants and awards are given to individuals, in many cases those individuals are affiliated with an institution. Under the SORP, the Society is required to give an analysis of the range of institutions for whom grants and awards are paid:

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	1,500	ATREE, University Bangalore, India
	1,450	University of Barcelona, Spain
	1,468	University of Portsmouth, UK
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	1,274	University of Milano, I
Total	**17,534**	

In the year the total amount of grants to institutions was £13948.

8. INVESTMENTS

In 2022 no funds were transferred to the COIF Investment fund and to the Fixed Interest Fund.
The following investments are held as at 31st December 2022

	Number of units	Price	Market Value	Book Value
		31-Dec-22	31-Dec-22	31-Dec-21
		£	£	£
COIF Investment Fund (Accumulation Units)	1,364.59	220.699	301,164	330,944
COIF Fixed Interest Fund	83,479.39	1.1619	96,995	110,877
			398,158	**441,821**

These investments have been valued at market price (£398,158) in the Balance sheet, with appropriate adjustment (£43,663 - £0 transfers) for the decrease in their value (£43,663) in the Statement of Financial activities as an unrealised loss.

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The following accounts are held and the balances in each account are:

	2022	2021
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HSBC Bank Current Account	99,544	85,894
Total	**101,667**	**87,996**

10. CURRENT ASSESTS & LIABILITIES

The following debtors are outstanding

	2022	2021
	£	£
Forum Travel awards not used	-	-

The following creditors are outstanding:

	2022	2021
	£	£
Society Journal (provision)	12,000	12,000
Accruals	1,248	1,188
	13,248	**13,188**

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The following movements have taken place within the Society's four designated funds:

	Revenue	Annual Award	CM Yonge Award	Reseach & other Awards	Total
	£	£	£	£	£
Balance: 1st January 2022	**420,879**	**6,500**	**9,250**	**80,000**	**516,629**
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Grants	-	- 500	-	- 17,534	**- 18,034**
Allocated Surplus: 2022	- 30,945	353	- 207	15,968	**- 14,831**
Balance: 31st December 2022	**390,827**	**6,500**	**9,250**	**80,000**	**486,577**

The Trustees can, by resolution at one of their meetings, re-designate these funds for other purposes.

REGISTERED CHARITY NUMBER: 275980

REPORT OF THE TRUSTEES AND UNAUDITED FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2022 FOR THE MALACOLOGICAL SOCIETY OF LONDON

Staffords
Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
Oakington Road, Girton
CAMBRIDGE
Cambridgeshire
CB3 0QH

THE MALACOLOGICAL SOCIETY OF LONDON

CONTENTS OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2022

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2022

The trustees present their report with the financial statements of the charity for the year ended 31 December 2021. The trustees have adopted the provisions of the Charities SORP (FRS102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

STRUCTURE, GOVERNANCE AND MANAGEMENT

Governing document

The charity is controlled by its governing document, a deed of trust, and constitutes an unincorporated charity.

The governing document is continually reviewed following its original adoption on 17 May 1978, with the current operative revision of the governing document being that amended on 28 April 2005.

Recruitment and appointment of new trustees

Nominations for Council (the board of related party) from members must be proposed and seconded and in the hands of the Secretary by December 31st. Members at the AGM 2016 proposed and seconded that only the Society's President and Officers (Treasurer, Secretary, Membership Secretary, Awards Secretary) are forming the board of trustees. It shall be the duty of Council to nominate members for election to the offices of President, Treasurer, Secretary, Membership Secretary, Editor of the Journal, Editor of the Bulletin, Archivist, Web Manager, and Awards Secretary, and for the vacancies in the Council caused by annual retirement. Nominations from the members and from Council shall be submitted to the Society with the notice convening the Annual General Meeting which shall be sent to every member of the Society not less than fourteen days before the Meeting.

In the case of a vacancy arising in any office of the Society, or in the Council, other than by way of resignation or retirement in the Annual General Meeting, the Council shall have power to appoint a temporary Council member to that vacancy until the next Annual General Meeting.

Risk management

The trustees have a duty to identify and review the risks to which the charity is exposed and to ensure appropriate controls are in place to provide reasonable assurance against fraud and error.

In particular:

(a) Admission fees and annual subscriptions shall be such sums as may be determined by a Special General Meeting convened under Rule VI(c), or at the Annual General Meeting.

(b) Subscriptions shall be due on the 1st of January in each year; but in the case of a new member, immediately after election. Members elected during the months of November and December, however, shall not be required to pay for the year in which they are elected.

(c) Any member whose current subscription has not been received in full by 31 January shall be reminded of the arrears in subscription and be informed that despatch of the Journal is suspended until the arrears are paid. No member whose subscription is twelve months in arrears shall be entitled to any of the privileges of the Society, and any member whose subscription is two years in arrears shall cease to be a member of the Society, unless the Council decide otherwise.

(d) The Council shall revise and publicise the conditions of the Society's awards and grants from time to time.

(e) For the purpose of legal protection of the property of the Society, all funds, books and other property shall be declared vested in Council as the Society's Trustees.

(f) The Council shall cause to be kept Minutes of Council and Society Meetings and books of account in respect of all receipts, payments, assets and liabilities. Accounts shall be presented to each Annual General Meeting for approval by members and such accounts shall be audited or independently examined as appropriate.

OBJECTIVES AND ACTIVITIES

Objectives and aims

The governing document contains the following in relation to the objective of the charity:

The objects of the Society are to advance education, research and learning for the public benefit in the study of molluscs from both pure and applied aspects. In furtherance of these objects, but not further or otherwise, the Society shall have the following powers:

(a) To promote and co-ordinate meetings and symposia,

(b) To promote and co-ordinate research both pure and applied;

(c) To provide for the worldwide dissemination of the useful results of such research by publication of the Journal of Molluscan Studies;

(d) To award prizes to outstanding students in the field of molluscan biology;

(e) To award research grants to individuals which will advance the study of molluscan biology;

(f) To do all such things as will further the objects of the Society.

Significant activities

In 2022 the Malacological Society of London held a virtual AGM meeting with the online symposium “Molluscan Tropical Biodiversity”, and the annual Molluscan Forum for Young Scientists was also held as a hybrid meeting with online and in-person presentations. The Society published the members' bulletin "The Malacologist" and in cooperation with Oxford University Press "Journal of Molluscan Studies".

Public benefit

The charity's objects are for the public benefit because increasing public knowledge is required as they form an important part of the global biodiversity and ecosystem stability which can have effects on human health and are a human food source.

ACHIEVEMENT AND PERFORMANCE

Charitable activities

In 2022 the main charitable activities were the funding of ten ECR and two SCR research projects, of which all were claimed, (total cost of £17,534), the support of three students to attend conferences and eleven students to attend the Molluscan Forum (£2,840), and support to the organization of two malacological conferences (£3,522).

FINANCIAL REVIEW

The finances of the Malacological Society have been impacted during 2022 by UK’s challenging economy ad stock market with an overall loss of £30,052 This loss is explained by significant losses in the Investment funds.

Our investments had an overall loss of £43,663 (comparing market value at 31 December 2022 with market value at 31 December 2021), with the COIF Investment Fund making a loss of £29,780 and the COIF Fixed Interest Fund a loss of £13,883. During 2022, no funds were transferred from the current account to savings accounts.

Separately, the profit-share from the publication of the Journal of Molluscan Studies in 2022 provided the Society with most of its income contributing £43,431, compared to £48,035 in 2021. This year OUP did not provide information on sales of the digital archives. The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal.

In 2022, more funds were used for research awards, being £17,534 in 2022 compared to £13,948 in 2021, and spending on travel and meeting related spending, significantly dropped during the pandemic, increased to pre-pandemic levels. The Society (MSL) spent more money in 2022 compared to 2021, this was mainly based on more expenses paid for research, travel and meeting awards.

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2021

REFERENCE AND ADMINISTRATIVE DETAILS

Registered Charity number
275980

Principal address
c/o British Antarctic Survey
High Cross
Madingley Road
CAMBRIDGE
CB3 0ET

Trustees

J Ablett	President
Dr H Wood	Membership Secretary
Dr K Linse	Hon. Treasurer
Dr Debbie Wall Palmer	Hon. Secretary
Dr Lauren Sumner Rooney	Awards Officer

Independent examiner
Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Approved by order of the board of trustees on ..... and signed on its behalf by:

.....
Jonathan Ablett - Trustee

INDEPENDENT EXAMINER'S REPORT TO THE TRUSTEES OF THE MALACOLOGICAL SOCIETY OF LONDON

I report on the accounts for the year ended 31 December 2022 set out on pages five to ten.

Respective responsibilities of trustees and examiner
The charity's trustees are responsible for the preparation of the accounts. The charity's trustees consider that an audit is not required for this year (under Section 144(2) of the Charities Act 2011 (the 2011 Act)) and that an independent examination is required.

It is my responsibility to:

- examine the accounts under Section 145 of the 2011 Act
- to follow the procedures laid down in the General Directions given by the Charity Commission (under Section 145(5)(b) of the 2011 Act); and
- to state whether particular matters have come to my attention.

Basis of the independent examiner's report
My examination was carried out in accordance with the General Directions given by the Charity Commission. An examination includes a review of the accounting records kept by the charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and seeking explanations from you as trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit, and consequently no opinion is given as to whether the accounts present a 'true and fair view ' and the report is limited to those matters set out in the statements below.

Independent examiner's statement
In connection with my examination, no matter has come to my attention:

(1) which gives me reasonable cause to believe that, in any material respect, the requirements

- to keep accounting records in accordance with Section 130 of the 2011 Act; and
- to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the 2011 Act

have not been met; or

(2) to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Date: .....

The Malacological Society of London

Statement of Financial acitivities (incorporating an income and expenditure account) for the year ended 31st December 2022

Note		TOTAL 2022	TOTAL 2021
	INCOMING RESOURCES		
	Income from Activities of the Charity		
	Members' Subscriptions: Current Year	3,035	2,205
	Collection of Subscription Arrears		-
4	OUP: Income from Journal Publication	43,431	48,035
2	Income from sale of Digital Archive	-	2,454
	Sundry Income	33	105
	Donations	-	-
	Income from Investments	-	
3	Interest	21	-
3	Dividends	2,813	3,181
	TOTAL INCOMING RESOURCES	**49,333**	**55,980**
	RESOURCES USED		
	Awards		
	Annual Award	500	-
	WCM Award	200	-
7	Research Awards (Early career & Senior)	17,534	13,948
	Malacological meeting awards	3,523	-
		-	-
7	Travel Bursaries for conferences	1,500	300
5,6	Travel awards: AGM	-	-
5,6	Travel awards: Forum	1,340	-
		24,597	**14,248**
	Directly Relating to Work of Charity		
4	Journal expenses (member fees)	2,492	4,524
4	Journal colour plates	-	1,080
4	Journal editor expenses, incl meetings	2,100	1,624
5	Malacologist Expenses	-	286
6	Meeting Expenses	2,900	300
	Independent examiners expenses	1,248	1,188
5,6	Council Meeting travel expenses	617	-
	Web sites	560	-
5	Postage, Printing & Stationary	-	446
	Charges for cc subscription collection	58	36
	Bank charges	404	132
	Sundries	748	-
	Total	**35,723**	**23,863**
	NET INCOME	**13,610**	**32,117**
8	LOSS/GAIN ON REVALUATION OF FIXED ASSETS	- 43,663	41,202
	NET MOVEMENT IN FUNDS	- 30,052	73,319
	TOTAL FUNDS BROUGHT FORWARD	516,629	443,310
	TOTAL FUNDS CARRIED FORWARD	**486,577**	**516,629**

CONTINUING OPERATIONS

All income and expenditure has arisen from continuing activities.

The Malacological Society of London

Balance Sheet at 31 December 2022

Note		2022	2021
		£	£
	FIXED ASSETS	**398,158**	**441,821**
8	Tangible Assets		
	CURRENT ASSESTS		
11	Debtor	-	-
9	Cash at Banks	101,667	87,996
10	CREDITORS: (Amounts falling due within one year)	- 13,248	- 13,188
	NET CURRENT ASSETS	**88,419**	**74,808**
	TOTAL NET ASSETS	**486,577**	**516,629**
	FUNDS		
	Unrestricted (Designated):		
11	Annual Award Fund	6,500	6,500
11	CM Yonge Award Fund	9,250	9,250
11	Centenary Research Award Fund	80,000	80,000
		95,750	95,750
11	General reserve Fund	390,827	420,879
	TOTAL FUNDS	**486,577**	**516,629**

Katrin Linse
Honorary Treasurer & Trustee

Dated

Jonathan Ablett
President & Trustee

Dated

The Malacological Society of London

Notes to the Financial Statements for the year ended 31st December 2022

1. ACCOUNTING POLICIES

Basis of Preparing the Financial Statements

The financial statements have been prepared in accordance with the Charities SORP (FRS 102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

- The SORP normally requires a columnar fomat, in this entities case the trustees' view is this is not appropriate as there are neither restricted funds nor endowment funds and so all of the activity in the year would fall within the unrestricted fund column.

Accounting Convention

The financial statements have been preprared under the historical cost convention, except for those items described immediately below.

- The historic cost basis of accounting is used except for investments, which have been included at their market value where readily available at the yearend date.

Going concern

The Trustees consider that there are no material uncertainties about the charity's ability to continue as a going concern.

Reconciliation with previously Generally Accepted Accounting Practice

In preparing the accounts, the trustees have considered whether in applying the accounting policies required by FRS102 and the Charities SORP FRS 102 the reinstatement of comparative items was required. In the case of this charity, no changes were made.

Fund accounting

- The Society funds, including funds available for awards, are not subject to any restrictions regarding their use, and are available to be used for the general purposes of the Charity. Consequently they are classified as 'Designated Funds'.

Taxation

- The charity is exempt from tax on its charitable activities.

Significant judgements

Apart from those judgements involving estimations, the management has not made any judgements in the process of applying the entity's accounting policies that have significant effect on the amounts recognised in the accounts. There are no key assumptions concerning the future or other key sources or estimation uncertainty at the reporting date that have significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next reporting period.

Financial reporting standard 102 - reduced disclosure exemption

The charity has taken advantage of the following disclosure exemption in preparing these financial statements, as permitted by FRS 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland':

- the requirements of Section 7 Statement of Cash Flows

Resources Expended

Expenditure is accounted for on an accruals basis and has been classified under headings that aggregate all cost related to the category. Where costs cannot be directly attributed to particular headings they have been allocated to activities on a basis consistent with the use of resources.

Incoming Resources

All income is recognised in the Statement of Financial Activities once the charity has entitlement to the funds, it is probable that the income will be received and the amount can be measured reliably.

Foreign currencies

- Asessts and liabilities in foreign currencies are translated into sterling at the rates of exchange ruling at the balance sheet date. Transactions in foreign currencies are tranlated into sterling at the rates of exchange ruling at the date of transaction. Exchange differences are taken into account in arriving at the operating result.

Incoming Resources and Resources used

· Subscriptions for annual membership are treated as follows:

Pre-paid in prior year	Liabilities
Paid in current year	Incoming Resource: subscriptions
Unpaid at 31st December	Not included in accounts. No debtor
Subsequently recieved	Incoming Resource: collection of subscriptions in arrears

· The costs of the Society Journal and supplements are written off in the year of initial distribution.

· The Profit Share from Oxford Journals is included in the year of receipt and not accrued.
The amount of Profit Share cannot be determined accurately by OUP until after the Society's AGM.

2. SALE OF THE DIGITAL ARCHIVE BY OUP

Since 2010 the sale of the digital archives by OUP has generated a windfall profit of £13,969 in 2010, £9,284 in 2011, £7,299 in 2012, £10,068 in 2013, £7,827 in 2014, £10,590 in 2015, £2,805 in 2016, £10,429 in 2017, £4,238 in 2018, £1,352 in 2019, and £506 in 2020.

3. INTERESTS & DIVIDENDS

Income has been derived from the following sources and has been applied to funds as indicated:

		2022	2021
		£	£
Sources	COIF Deposit Fund Interest	-	-
	COIF Fixed Interest Fund Dividend	2,813	3,181
	COIF Investment Fund Dividend		
		2,813	**3,181**
Beneficiary	Revenue Fund	893	1,010
	Annual Award Fund	147	166
	CM Yonge Award Fund	207	234
	Research Grants other Funds	1,566	1,771
		2,813	**3,181**

4. JOURNAL The surplus resulting from publication of the Journal is as follows

	2022	2021
	£	£
Profit Share from OUP	43,431	50,489
Less: sales of digital archives	-	- 2,454
Profit Share from OUP re Journal	**43,431**	**48,035**
Less:printing costs provisioning	- 12,000	- 12,000
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Allocated Surplus: 2022	- 30,945	353	- 207	15,968	**- 14,831**
Balance: 31st December 2022	**390,827**	**6,500**	**9,250**	**80,000**	**486,577**

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THE MALACOLOGICAL SOCIETY OF LONDON

England & Wales - Charity number 275980

Accounts

ISSN 1759-1406

The Malacologist

The Bulletin of The Malacological Society of London

NUMBER 79 AUGUST 2022

Contents

This image was presented by Dr V Knutson in her talk at the AGM conference on Molluscan Tropical Biodiversity. The abstract of the talk, entitled

Many species, but few names: phylogenetics and species delimitation of the (mostly) tropical nudibranch genus Gymnodoris

can be seen on page 15 of this issue

The Malacological Society of London was founded in 1893 and registered as a charity in 1978
(Charity Number 275980)

EDITORIAL

Please see page 20 for the details for this year's Malacological Society of London Molluscan Forum on **Thursday 17th November 2022**. The event will take place in the Flett lecture theatre (Natural History Museum, London) . In-person talks (most likely using Zoom or Teams), will be broadcast and there will be two virtual sessions (with limited spaces) for people who are unable to attend in person to present their talk. If the COVID situation within the UK deteriorates prior to the Forum, or the Natural History Museum decides that it is not possible to accommodate external attendees, a decision will be made at the earliest possible opportunity to move the whole Forum to a virtual format as we did last year. If you plan to attend in person we recommend you use refundable/transferable options where possible in case the Forum moves online only. Poster sessions are back this year (replacing quick-fire talks of recent Forums) but will only be available for in-person presenters. The deadline for registrations and talk applications is **Friday the 1st of October** and presenters will be informed of successful applications soon after**.** Attendance is **free!**

This issue also contains a Senior Research Grant report by Abraham Breure entitled *Towards an annotated and illustrated checklist of Peruvian land snails: a visit to Berlin.* The Council of the MalacSoc are always pleased when research grant reports appear in *The Malacologist; i*t helps us feel our efforts have not been in vain! I particularly draw attention to the Award report (from the AGM) by Dr Lauren Sumner Rooney on page 12, which shows the care the Society applies to the awarding process. Issue 78 also includes reviews of three books, *A Guide to Land Snails of Australia* by Stanisic, J., Potter, D. & Stanisic, J. , *The Sound Of The Sea by* Cynthia Barnett and *Interesting Shells by* Andreia Salvador. *The Malacologist* is the medium by which the annual performance of the Malacsoc is made public via the President's report of Council (see page 8) This issue also includes bstracts of the conference which traditionally accompanies the AGM; this year the conference was on *Molluscan Tropical Biodiversity*.

TAXONOMIC/NOMENCLATURAL DISCLAIMER
This publication is not deemed to be valid for taxonomic/nomenclatural purposes [see Article 8b in the International Code of Zoological Nomenclature 3rd Edition (1985), edited by W.D. Ride *et al.*].

Editor - Georges Dussart
Emeritus Professor,
Canterbury Christ Church University
georges.dussart@canterbury.ac.uk

NOTICES

Trial changes to the Travel Awards of the Malacological Society of London

For the year 2022-2023, the Society will trial two updates to the current travel award scheme.

First, to better align with the academic seasons, the application deadlines will be shifted to **1st March** for travel starting between 1st June and 30th November of the current year, and **1st September** for travel starting between 1st December of the current year and 31st May of the following year. You must apply to the correct round of awards.

Second, in order to alleviate financial stress on award recipients, the Society will trial making award payments upfront, instead of following travel. Recipients will be asked to provide contact details for their academic supervisor, and to confirm that, if travel does not take place, that they will return their award in full.

For further information, see page 23 in this issue of *The Malacologist.* If you have any feedback on these changes, please contact the Awards Secretary at MSL_awards@nhm.ac.uk.

Ingenious but…….

This ball of shells is an ingenious piece of work. It was seen in a Bed and Breakast hotel in the UK.

How many of these and similar shelly pieces are there in the world? Can our molluscan communities really sustain this kind of routine harvesting. On the other hand, people can derive an income from making and selling such things, but is it sustainable?

Bridging the gap

An example of why molluscs are malacological can be seen in this video
(Malacology derives from Ancient Greek μαλακός (malakós) 'soft', and -λογία (-logía = knowledge)

https://fb.watch/d_IYhKmakX/

A sinister error

From Martin Willing

"My attention was drawn to a feature on p. 4 of issue 78 (of *The Malacologist*) on *Vertigo moulinsiana* making itself useful with regard to a new road scheme. I was involved (working for Friends of the Earth) in the Newbury Bypass 'battles' in the 1990s when this snail gained infamy as 'the Newbury Bypass Snail'. I think that there may be a slip re. the figured snail on p. 4 ... it is shown as a sinistral snail whereas (unless it was a freak!) it should be dextral. "

This may have been a mistake in production of the newspaper article from which this piece came. The mirror image of the original photo may have got into print. Thanks to Martin for setting us straight. (Ed.)

The Annual Award of the Malacological Society of London

This year, the award was granted to Franziska Bergmeier of Ludwig-Maximilians Universitat, Munich for her thesis on Solenogastres. The panel felt that the extent and quality of the work in the thesis *From shallow sands to deep-sea trenches: Towards integrative systematics of Solenogastres* (Aplacophora, Mollusca)' was exceptional, and made a substantial contribution to our knowledge of these somewhat enigmatic creatures.

Conservation of molluscs

If you are into freshwater conservation, you may wish to check out this new report: Fantastic Freshwater: 50 landmark species for conservation | IUCN . It includes 5 species nominated by the IUCN SSC Mollusc Specialist Group. These include the Colombian freshwater oyster, the Elegant adriatic freshwater mussel, the Naegele spring snail, the Bakara Sulawesi elephant snail, and the Wicker limpet.

The full report is available at
Fantastic-freshwater-v14-1.pdf (shoalconservation.org)

Diarmaid Ó Foighil
University of Michigan (first broadcast on Molluscanet)

An Age-old Mystery Solved

Dr Greg Herbert (University of South Florida, Tampa) and collaborators published a much-awaited peer-reviewed article on the lifespan of the Horse Conch, *Triplofusus giganteus.* They also estimated the age at which females of the species produce their first spawn. In their study, the authors used stable oxygen and carbon isotopes sclerochronology (the dating of hard biological structures such as bones, corals, and shells) to gather information on life cycles. Among other samples, included in their study were two large Horse Conchs from the National Shell Museum collection, measuring 460 and 475mm

PLoS 1 2022 Apr 6;17(4):e0265095 doi: 10.1371/journal.pone.0265095. eCollection 2022.

(This was a news item from the Bailey Matthews Shell Museum - https://www.shellmuseum.org)

Freshwater Gastropods of North America Project—expansion

We are pleased to announce the expansion of the *Freshwater Gastropods of North America* project through the entirety of the Tennessee and Cumberland River drainage systems, increasing the coverage of our FWGTN web resource from approximately 22,000 square miles (767 sites) to over 58,000 (1,700 sites). We document 54 species of freshwater gastropods with 16 subspecies in this malacologically rich region, offering ecological and systematic notes for each, as well as detailed distributional maps, a dichotomous key and a photo gallery. This expanded web resource, authored by R.T. Dillon, M. Kohl and R.E. Winters, is available here**: https://www.fwgna.org/FWGTN/**

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Our complete FWGNA database, covering drainages of the Ohio as well as Atlantic drainages from Georgia to the New York line, now contains 22,044 records documenting 107 species of freshwater gastropods, with 21 subspecies. We have updated our overall website with a new continental-scale biogeographic analysis, dividing these records into North Atlantic, South Atlantic, Ohio, and Tennessee/Cumberland. **Our analysis suggests that natural selection has been more important in the evolution of freshwater pulmonates than gene flow restriction, but that gene flow restriction has been more important in the evolution of freshwater prosobranchs than natural selection.**

We also announce today the publication of an updated "Synthesis v3.1," ordering our 107 species by their incidence in our continental database and assigning fresh FWGNA incidence ranks to all.

Dr. Robert T. Dillon, Jr.
http://www.fwgna.org/dillonr/
DillonR@fwgna.org

Parasites in the invasive snail *Cipangopaludina chinensis*

"Clarkson University graduate student Nimanthi Abeyrathna, who is pursuing her doctoral degree in the Biology Department's Interdisciplinary Bioscience and Biotechnology (IBB) program, was recently awarded an Early Career Research Award from the Malacological Society of London (MSL), a molluscan research society based in the United Kingdom. Her proposal entitled '*Genetic characterization of parasites in the invasive snail Cipangopaludina chinensis in the US*' seeks to document the parasitic fauna of an exotic snail for the first time in its North American invasive range using DNA barcoding techniques. The project is a small part of her larger dissertation which aims to understand the invasion dynamics of exotic aquatic snails in the New York Great Lakes Basin.

The MSL's Early Career Research Grants are conferred on students and researchers without regard to nationality and are assessed on scientific merit, value of the project and the extent to which the research will benefit the applicant's scientific aspirations. Once completed, the study is featured in the society's newsletter *The Malacologist* and researchers are encouraged to present their results at the annual Molluscan Forum held in the United Kingdom.

Nimanthi is a graduate student in Professor Andrew Davinack's Lab and a Teaching Assistant for both Introductory Biology and Anatomy and Physiology labs in the Biology Department.
To learn more about Clarkson University, go to www.clarkson.edu."

Octopus carving

Octopus carved with chain saws (and other tools) from a Giant Redwood stump.

Artist - Jeffrey Michael Samudosky

From
illuzone.net

Senior Research Grant Reports

Research financially supported by the Malacological Society of London

Towards an annotated and illustrated checklist of Peruvian land snails: a visit to Berlin

Abraham S.H. Breure[1,2,3]

[1]Royal Belgian Institute of Natural Sciences, Brussels (Belgium)
[2]Natural History Museum, Invertebrate Division, London (U.K.)
[3]Naturalis Biodiversity Center, Leiden (the Netherlands)
Email: ashbreure@protonmail.com

Faunal lists for countries are a great help for taxonomists and conservation assessments. For molluscs, they are available for many countries. For the Neotropical realm however, they are only partially present and up-to-date (*e.g.,* Simone, 2006; Massemin *et al*., 2009; Thompson, 2011; Linares & Vera, 2012). We recently published the first illustrated checklist for the non-marine molluscs of mainland Ecuador (Breure *et al.*, 2022), which gives the original publication, type locality, distributional data derived from literature and several museums plotted on maps of ecoregions, plus photographs of type specimens (if located) or original figures (if published). This overview lists all the 331 species known of land and freshwater snails, of which 179 are considered as endemic. For 60 species, only imprecise localities are known, while for 169 species, no modern (i.e. last 50 years) records exist. This shows that such overviews can, for a country, shine a spotlight on our current knowledge (or the lack thereof) and therefore form a baseline for further research.

Similar to Ecuador, Peru is an equally biodiverse country for which only a list of molluscan taxonomic names is available, without underlying data (Ramirez *et al.*, 2003). The list contains names of 763 land snails and 129 freshwater snails. To keep the objective of assembling an illustrated and annotated checklist in manageable portions, we decided to split it into several parts. A first paper has already been published (Breure & Mogollón Avila, 2016) dealing partially with the dominant group within the country, the superfamily Orthalicoidea. Working on this paper and on the Ecuador project, we found that GBIF data are incomplete and contain many misidentifications. The reason why we try to visit museum collections personally or ask collection managers for photographs of suspected misidentifications is to guarantee a reasonable data quality as the basis for our work. The Museum für Naturkunde in Berlin (ZMB) was one of our targets because it contains a relatively large amount of type material.

Figure 1 Cabinets in the ZMB Mollusca collection.

The visit, for which the Malacological Society of London (MSL) kindly awarded me a Senior Research Grant, was originally planned for December 2021, but had to be postponed to June 2022 due to pandemic restrictions. The Mollusca collection is stored in wooden cabinets (Fig. 1), arranged according to families. Working my way through the cabinets I took snapshots of all relevant lots of land snails from Peru (and also Ecuador), including both type material and non-type material. In this way I found type material of 30 Peruvian taxa and took 375 photos of non-type specimens. Working in such a historical collection, one should always be aware that it is possible to encounter specimens that could be considered as type-material, especially - when, like in Berlin, provenance data are often complete. After checking the original publications, I found 25 lots with unrecognised type-material belonging to different families. Interestingly, contacts between 19th century malacologists were also discovered, *e.g.* Johann Christian Albers was in contact with Sauveur Petit de la Saussaye (Fig. 2) and Jacques Moricand (Fig. 3).

These results will be used in forthcoming publications on Peruvian mollusks (and also in additions to the Ecuadorian checklist). We would like to thank the Awards Committee for the Senior Research Grant that made this visit possible. Finally we thank Thomas von Rintelen and Christine Zorn (ZMB) for their hospitality and support.

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Figure 2. ***Isomeria juno*** **(L. Pfeiffer, 1850), with the original label in Petit's handwriting at the top; the label in red ink is characteristic of the Albers collection.**

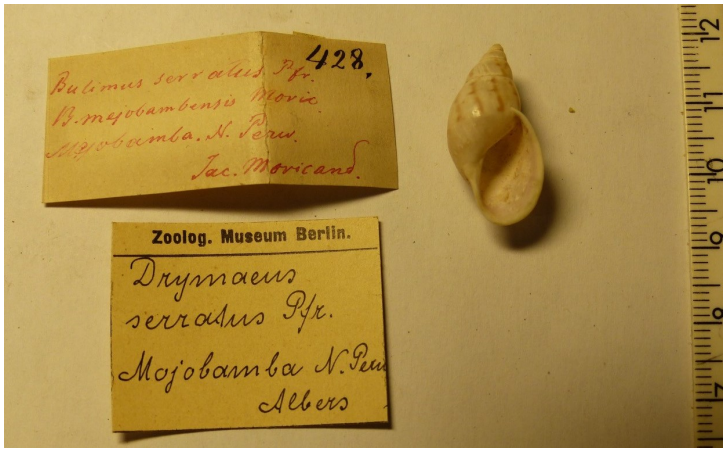

Figure 3. ***Drymaeus serratus*** **(L. Pfeiffer, 1855), with the Albers label showing that the provenance goes back to J. Moricand.**

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A snail with iron armour

The fearsome-looking scaly-foot snail developed its armour to excrete sulphur in the depths of the ocean. They only live at three tiny sites. Photograph: Dr Chong Chen/IUCN

Annual report of Council for 2020-2021

delivered by the President, Jon Ablett at a virtual Annual General Meeting on March 16th 2022

Membership (report from Membership Secretary Harriet Wood)

When taking over the membership secretary post in April 2021 there was some disparity between the number of paying members and a larger number listed with OUP receiving JMS access. An up-to-date members list was therefore brought together as a priority and we have worked closely with OUP to make sure that our lists are in alignment.

From January to December 2021 there were 89 members, including 30 students. A number of these members were offered free membership for the year due to journal access issues during the period in which they had previously paid. For 2022, we currently stand at 64 members: 11 of which are students, 8 of which are new to the Society and 7 of which are lapsed returning members. This is noticeably lower than in previous years and this may be partly to do with the cancellation of the printed journal in January 2021.

We have been working with OUP to solve historic issues with *JMS* web access and missing printed journal back issues. OUP have provided a direct point of contact for the web access problems and they have been responsive in sorting these out for the members who have contacted them. Those members with missing JMS printed issues, that we are aware of, were contacted and we are arranging to print those that we can for them.

We are also working with our web developer, and OUP to set up 'member level referral access' between the MSL and OUP websites, which will reduce the need for OUP to hold members personal information. Also, to streamline the process for new members we have removed the downloadable application form from the website and ask that new members only use the online application form, whilst renewing members must log into their account before making a new payment.

Generally, we hope that members have seen improved communication over the past months, as we greatly value the support that you give to the Society.

Finance for the financial year ending 31st December 2021 (report from Honorary Treasurer Katrin Linse)

The finances of the Malacological Society have been pleasing during 2021 with an overall gain of £73,319. This gain is explained by a gain in the Investment fund and lower awards and meeting expenditure.

Investments had an overall gain of £41,202 (comparing market value at 31 December 2021 with market value at 31 December 2020), with the COIF Investment Fund making a gain of £49,015 and the COIF Fixed Interest Fund a loss of £7,814. During 2021, no funds were transferred from the current account to savings accounts. Separately, the profit-share from the publication of the *Journal of Molluscan Studies* in 2021 provided the Society with most of its income contributing £48,035. The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal. In addition, sales of the digital archives provided £2,454 of income. In 2021, a little more funds were used for research awards, being £13,948 in 2021 compared with £12,262 in 2020, while travel awards significantly dropped (pandemic related). There was reduced spending on Council meetings and Forum travel awards however, as meetings were held virtually.

The Society (MSL) spent less money in 2021 compared with 2020. This reduction however, was mainly based on there being less expenditure on meetings and to a reduction in the cost of colour plates once *JMS* moved to online-only.

Meetings

The AGM (report from President Jonathan Ablett)

The 129th AGM was held as a virtual meeting *via* Zoom, on the 16th March 2022. To coincide with the AGM a symposium was held on the theme of 'Tropical Molluscan Diversity'. We had 5 invited speakers:

Dr Nur Leena Wong W.S., International Institute of Aquaculture & Aquatic Sciences. Malaysia.
'Eating an undescribed species for 160 years - the problem with tropical cryptic species'

Dr Liew Thor Seng, Universiti Malaysia Sabah, Malaysia.
'Past, present and future challenges in tropical land snail diversity research in Malaysia'

Dr Rebecca J. Rundell, State University of New York. USA.
'Conservation and evolution of land snails in the lowland tropical rainforests of Belau'

Dr Vanessa Knutson, Department of Organismic and Evolutionary Biology, Harvard University. USA.
'Many species, but few names: phylogenetics and species delimitation of the nudibranch genus Gymnodoris'

Dr Christine Parent, University of Idaho. USA.
'Drivers and constraints of diversification in Galápagos endemic land snails'

Over 90 people registered from at least 20 countries, and I would like to thank John Grahame and Phil Hollyman for all their help on the day and in preparing the symposium.

The Molluscan Forum (report from Vice President Phil Hollyman)

The annual Molluscan Forum was held on the 18th of November 2021. For the second time this meeting was hosted virtually via Zoom. An attempt was made to organise this meeting in a hybrid format, but due to the low uptake of in-person attendees, a decision was made to change the meeting to fully virtual. Over 150 people registered in advance for the event. As in 2020, the shift to a virtual platform had a clear impact on accessibility for international delegates, improving the ability of many people to attend and present.

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This year also saw the continued use of quick-fire talks in place of poster sessions, giving each speaker five minutes and two slides to present their findings. Overall, there were 42 applications for full and quick-fire talks, which were presented during three full and three quick fire sessions throughout the day. The Oxford prize, awarded annually for the best early career talk, was given to Alison Irwin (The Natural History Museum of London/University of Bristol) for her talk titled: '*Function and Evolution of High-Resolution Spatial Vision within Stromboidea'*.

Publications

***The Journal of Molluscan Studies* (report from Editor Dinarzarde Raheem)**

The ISI impact factor for the Journal in 2020 increased to 1.348 (compared with 1.461 in 2019, 1.345 in 2018, 1.483 in 2017 and 1.250 in 2016). The Journal stands at number 98 in the ISI list of 125 zoological journals (it was 63 out of 168 in the previous year). The Journal continues to be truly international in terms of the geographical distribution of its authors; for volume 86 (2020) the corresponding authors represented 19 countries (of which the leaders were 26% USA and 16% Germany). The average publication time from receipt to Advance Access publication was 10.1 weeks for 2020.

Circulation for the Journal in 2021 was 29 institutional and 85 membership subscriptions (compared with 32 and 152 respectively for 2020). In addition, a further 2,610 institutions have electronic access to the Journal through publishers' collections (includes migrated figures; compared with 2,530 in 2020) and 37 have access through OUP's Developing Countries Offer (for details see http://www.oxfordjournals.org/access_purchase/developing_countries.html).

The new pricing structure has been fixed for 2022. The cost for an online-only subscription is £569.00/$1082.00/€854.00 for institutional subscriptions and £711.00/$1350.00/€1066.00 for corporate subscriptions. Please see https://academic.oup.com/mollus/subscribe for more information.

Volume 87 (2021) contained 52 papers, research notes and review articles. In total, 122 manuscripts were submitted in 2021 (a decrease of 9.6% on the 127 in 2020) and the acceptance rate was 43%. The image of the giant clam *Tridacna squamosa* on the cover of Volume 88 was kindly donated by Alex Mustard.

Our board of Associate Editors now comprises: Coenraad Adema (immunology, genomics, parasitology), Thierry Backeljau (molecular phylogenetics and genetics), Liz Boulding (population and reproductive biology), Robert Cameron (ecology and genetics of terrestrial gastropods), Richard Cook (agricultural malacology, physiology, feeding behaviour), Simon Cragg (life histories, sense organs), Mark Davies (marine ecology and behaviour), Dan Graf (freshwater bivalves), John Grahame (population genetics, morphometrics), Liz Harper (marine bivalves), Gerhard Haszprunar (microanatomy, 3D reconstruction, minor molluscan classes), Bernhard Hausdorf (terrestrial gastropods), Michal Horsák (ecology and biogeography of terrestrial gastropods), Yasunori Kano (systematics of vetigastropods, tropical ecology), Joris Koene (reproductive behaviour of gastropods), Nicole Limondin-Lozouet (palaeoecology), Manuel Malaquias (opisthobranchs), Peter Marko (marine biogeography and phylogenetics), Pablo Martín (freshwater ecology, life history), Ellinor Michel (ecology, freshwater gastropods), Jeff Nekola (community ecology of terrestrial gastropods), Nicolas Puillandre (neogastropods), Ellen Strong (freshwater and marine caenogastropods), Janet Voight (cephalopods), Janice Voltzow (microscopic anatomy), Heike Wägele (opisthobranch biology), Tony Walker (biochemistry, immunology, cytology), Suzanne Williams (molecular phylogenetics and genetics) and Yoichi Yusa (general ecology and behaviour). Nerida Wilson has temporarily stepped down from the editorial board.

I would like to thank all the members of the editorial board and those members of the international malacological community who have contributed to the review process. At Oxford University Press, I would like to thank Cailin Deery, Jude Roberts and Oluwatooni Akinkuotu (Publishers); Gemma Cannon (Senior Publisher); Joe Matthews, Katie Kent and Yasmin Bahar (Journal Managers); Jennifer Paxton-Boyd and Matt Pacey (Publishing Directors for Science); and Matt Senderling (Marketing Coordinator). My thanks also to Akash Mahajan, Shreya Shukla and their production team at Aptara Incorporated) for their work on behalf of the Journal.

***The Malacologist* (report from Editor Georges Dussart)**

At 56 pages, the August 2021 issue (Number 77) was an unusually large issue and included the usual mixture of research grant reports, travel grant reports, minutes and abstracts of the AGM and its accompanying conference, and unfortunately, obituaries.

As usual, the August issue (published on time) included abstracts from the covid-constrained, virtual conference on Molluscs in Extreme Environments which had accompanied our AGM in Spring 2021. This issue also included an invited article entitled *Marine shells: the beauty and the resilience* by Alessia Carini of the Swire Institute of Marine Science at the University of Hong Kong. It is encouraging to the Society's efforts to be able to present several Early Career Research Grant Reports, including an account of Franziska Bergmeier's work on *Molecular analyses of solenogaster midgut contents to determine food sources,* Alice Wilson-McNeal on the *Impacts of ocean acidification and pharmaceutical contamination on Mytilus edulis* and Samuel Abalde on *Using shotgun sequencing for disentangling a taxonomic jumble: the case study of the skenei-morphs*. Issue 77 included two book reviews—firstly of the book *Molluscan genomics: broad insights and future directions for a neglected phylum* by Angus Davison and Maurine Neiman which summarises a recent Royal Society conference, and secondly, of Peter Godfrey-Smith's book entitled *Other minds—the octopus and evolution of intelligent life*. The review also referenced a recent BBC documentary on octopuses. The obituaries included tributes to Brian Morton, Arie W. Janssen and Jack Burch.

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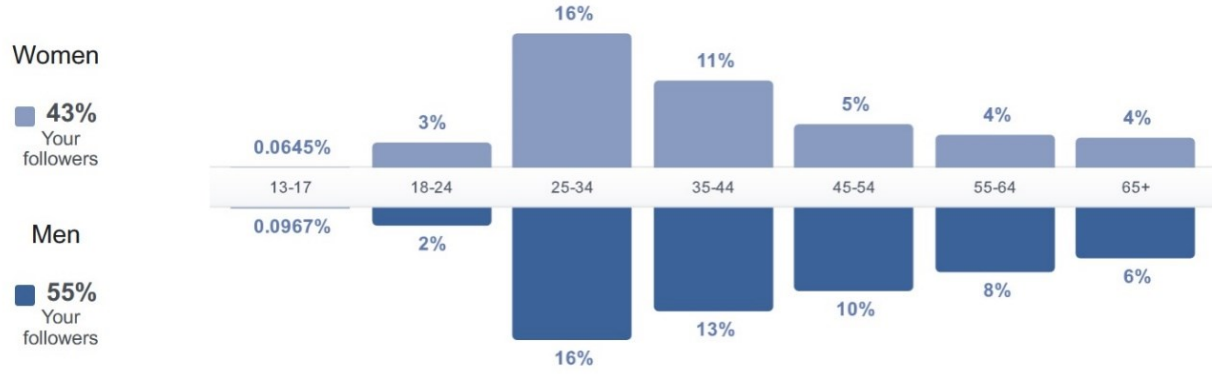
The February 2022 issue (Number 78) issue of *The Malacologist* was published on time and comprised 36 pages. As usual for the February issue, it included the notice of the AGM and nominations for Council. There were 17 pages of abstracts and a review of Rowson, B., Powell, Willing, M., Dobson, M. & Shaw H. *Freshwater snails of Britain and Ireland,* a book which had received financial supported from the Malacsoc. Issue 78 also included Early Career Research Grant Reports reports from Alice Buckner on *The immunological response of a gastropod mollusc to infection with a compatible trematode parasite*, Quiaz Hua on *Assessing population genetic structure and diversity of commercially harvested octopuses by use of conservation genetics* and Olga Utrilla Ojeda on *The molluscan fauna of mud volcanoes of the North Eastern Gulf of Cádiz: biodiversity and eco -biological effects.*

Website (report from John Grahame)

Overhauling and updating our website is an ongoing work-in-progress. For the first time in years the list of Council Members is accurate, at the cost of some loss of information (photographs). In the background, the site has been updated to recent WordPress standards; this work was done by the website's original designer. There has also been work on membership issues to do with subscription payment, which is now functioning more smoothly. As is the nature of these things, more remains to be done.

Facebook & Twitter (report from Chong Chen and Lauren Sumner-Rooney)

The Society's Facebook page (*http://www.facebook.com/malacsoc/*) continues to perform well. We currently have 3,203 followers on the page, continuing the trend of gradual increase over the years. We therefore have a direct outreach population of over 3,000 people/organisations who receive notifications about our posts, for example the post advertising the Society's 129th AGM has been seen by 2,460 people to date. Age demographics of the followers reveal that most of the followers are relatively young (below 45 years old, see figure below). In terms of countries represented, we have the most followers from USA (464), followed by Mexico (326), the UK (230), Brazil (187), Italy (185), and the Philippines (164).



The Society's twitter account currently has 592 followers and is another useful resource for communications

Awards (report from Awards Officer Lauren Sumner-Rooney)

Awards granted

Following Covid-related disruptions, three ECR award recipients requested and were granted extensions on their research projects. Two of these have now sent their grant reports for publication in *The Malacologist.* One travel award recipient requested to transfer their award to an alternative conference, after a cancellation, and this was granted.

Award applications

Overall, the Society is pleased with the number of applications that it receives for Travel Awards and Research Grants. The number of applications received for Travel Awards is however, still severely reduced due to the current global health situation. The schemes seem to be achieving their global aim to enable young scientists to engage in malacological research activity both in the laboratory/field and at meetings, and the Society has expanded the Early Career Research awards scheme to offer two new schemes aimed at widening participation (see below). Citable reports from researchers, funded through both schemes, appear in *The Malacologist*.

The Society aims to make the following awards annually.

Travel Awards - at least 5 each of up to £500 for Society members, £300 for non-members

Early Career Research Grants - at least 5 each of up to £1500, regardless of membership, plus one *Equity & Inclusion Award* and one *Global Development Award* for suitable applicants.

Senior Research Grants – up to 5 each of up to £1500, for members only

Application forms and guidance notes for both these schemes have been updated recently and can be downloaded from The Society's website.

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Early Career Research Awards

We received 17 applications for Early Career Research Awards in December 2021, from workers from 15 institutions in 10 different countries. Of these, three were eligible for the new *Global Development Award* and one was eligible for the *Equity and Inclusion Award*. Given the challenges faced by young malacologists over the past two years, and the healthy financial position of the Society, ten ECR awards were granted, including two *Global Development* and one *Equity and Inclusion* award.

On behalf of the Society, I would like to formally thank the members of the Grants Review Panel for their hard work in reviewing all applications. The Panel agreed the following awards, in alphabetical order.

N. Abeyrathna (Clarkson University, USA), **£1450**
'Genetic characterization of parasites in the invasive snail *Cipangopaludina chinensis* in the US'

Z. Chen (Zoologische Staatssammlung München, Germany), **£1500**
'Whole-genome sequencing project of *Sadleriana bavarica* Boeters, 1989'

N.K. Das (ATREE, University Bangalore, India), **£1500**
'Non-marine molluscs of anthropogenically impacted caves of Meghalaya: understanding diversity and threats for conservation'

J. Fernandez-Simon (University of Barcelona, Spain), **£1450**
'Diversity and characterization of the meiofaunal molluscs of the Catalan coast (Western Mediterranean)'

E. Giraud (University of Portsmouth, UK), **£1468**
'Ecological and evolutionary trade-offs in specialised predator-prey relationship where the prey is also a predator'

L.B. Guzmán (Universidad Nacional de La Plata, Argentina), **£1500**
'Comparative mitogenomics and phylogenetics of *Biomphalaria* snails transmitting schistosomiasis'

J. Martínez Sanjuán (Unviersity of Alabama, USA), **£1500**
'3D morphoanatomic study and molecular systematics of Pruvotinidae (Mollusca, Aplacophora)'

C. Monchanin (Thai Marine Ecology Center, Thailand), **£1450**
'Giant clam population, health and role as a substrate for scleractinian corals in Thai waters.'

J.A. Vidal Miralles (University of Barcelona, Spain), **£1497**
'Between sea angels and butterflies: a comprehensive phylogeny of Pteropoda molluscs'

K.M. Zarzyczny (University of Southampton, UK), **£1500**
'The genetic consequences of tropicalisation by intertidal gastropods.'

The total cost to the Society of the awards was **£14,815**, with a success rate of **59%** of applications

Senior Research Awards

Three applications for Senior Research Grants made in June 2021 were awarded.

B. Breure (Naturalis, Netherlands), **£1500**
'Peruvian land molluscs: towards an illustrated checklist with a visit to the Museum für Naturkunde, Berlin'

C. Little (University of Leeds, UK), **£1043.25**
'Mineral coatings on gastropods at hydrothermal vent sites: implications for fossilization processes'

H. Reise (Senckenberg Museum of Natural History Görlitz, Germany), **£1500**
'Hybridisation between the invasive pest slug *Arion vulgaris* and the native *A. atee*'

Travel Grants

June 2021

No applications for Travel Awards were received.

December 2021

We received four applications for Travel Awards. All were deemed suitable for support. Given that no travel awards were made in June 2021, all four were awarded.

- A. Irwin, World Congress of Malacology, **£500**.
- N.K. Das, World Congress of Malacology, **£300**.
- K. Dey, International Conference on Aquatic Invasive Species, **£500**.
- T. Goulding, World Congress of Malacology, **£500**.

Annual Award

The Society received two nominations for the Annual Award before the new deadline of 15th December 2021. Following review, the award went to Dr Franziska Bergmeier, for her PhD thesis;
'*From shallow sands to deep-sea trenches: Towards integrative systematics of Solenogastres (Aplacophora, Mollusca)'* completed at LMU München, Germany.

The reviewers felt that the extent and quality of the work undertaken were really exceptional, and make a substantial contribution to our knowledge on these somewhat enigmatic creatures.

On behalf of the Society, we extend our congratulations to Dr Bergmeier.

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Other matters

i. Use of references in scoring applications

Following the December 2021 round of ECR applications, Katy Collins highlighted the potential inequalities of using strongly weighted references in the selection process. Several issues are involved; first, as British and American referees are anecdotally more likely to be effusive, this may place other applicants at a false disadvantage. Second, applicants who have poor supervisory relationships may be placed at a disadvantage. Third, there were several instances in which one or even both references were missing. I was curious as to the reason and followed up the missing references; while one applicant had not informed their referees, the remainder had. These applicants are being handicapped by forgetful referees. There were also some examples of supervisors submitting a confirmatory email only, but being listed as a referee.

To explore the potential effects of references on overall scores, I compared the variance in scores for each criterion, for each reviewer in this round of applications. These were then corrected for the weighting given to each criterion. The corrected variance of References was the second highest of the criteria (following Value), indicating that it probably makes a substantial contribution to the total score variance. This is likely further exacerbated due to the high weighting of the references (15 points instead of 10). Incidentally, Value is the only other criterion scored out of 15; further clarification on the meaning of this criterion in the reviewers' instructions might be considered in future.

Proposed solutions;

a) Reduce the weighting of References to 5 or 10 / 100.
b) Repeat on the application form that it is the responsibility of the applicant to ensure their referees submit recommendations (currently this is only on the website).
c) Remove the line '*Supervisors should also send an email confirming their support' (section B2), and instead recommend that one of the two referees should be the supervisor (section B8).

ii. Summer studentships

Following discussions of a new summer studentship scheme for undergraduates from historically–excluded ethnic backgrounds, Dr Tanesha Allen (University of Oxford) has agreed to consult on this proposal. Details of the proposed scheme have been sent to Dr Allen and I will schedule a call to discuss it in the next couple of weeks.

iii. Assessment of annual awards

Concerns were raised within Council regarding the assessment of the Society's Annual Award. The comparability of, for example, Masters and PhD theses, or work in different fields, was highlighted as a potential problem. While an informal review process within Council has previously been used to decide the awards, this will be reviewed in the next Council meeting (June 2022).

Presidents Report

This has been my first year as President, and it is an enormous honour to have been asked to take on the role. It has been a huge learning experience and I would not have been able to do this job without the support and assistance of all the Council so thank you. Covid has of course meant that we have not been unable to meet as a Council in person this year and as in 2020, the Molluscan Forum was held entirely virtually. As the global covid situation changes, I hope we will be able to meet together over the coming year, but I feel we can use this experience to learn how we can better engage with Council who can not attend meetings and to reach wider audiences with our meetings whilst still encouraging collaboration and discussion at our in-person events.

Along with the *Journal of Molluscan Studies,* for me, the societies meetings, along with our awards and grants are the real stand-outs of the society's work. With the highly successful Molluscan Forum and the travel/research awards I think we have great opportunities to support and guide the next generations of malacologists. I am really excited about the new *Global Development Award* and the *Equity and Inclusion Award* and look forward to progressing with our studentship plans. We have also created an Early Career/Student Council position which I hope will allow us to react to the needs of the students and post-doc communities.

Officers and Council

Council at March 2022, and nominations going forward to 2023:

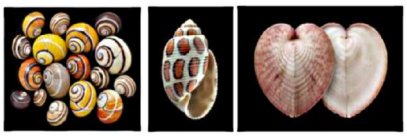
Year of existence	2021-2022	2022-2023
	128	129
President	Jon Ablett (1)	Jon Ablett (2)
Vice Presidents	Phil Fenberg (3)	Fiona Allan (2)
	Fiona Allan (1)	Phillip Hollyman (1)
Ex officio	John Grahame (1)	
Councillors	Phillip Hollyman (3)	Alan Hodgson (3)
	Alan Hodgson (2)	Aidan Emery (2)
	Aidan Emery (1)	Robert Cameron (2)
	Robert Cameron (1)	Victoria Sleight (2)
	Victoria Sleight (1)	Katie Collins (2)
	Katie Collins (1)	Rowan Whittle (1)
		John Grahame (1)
EC-Rep		Thomas Goulding (1)
Co-opted	Rowan Whittle (1)	Phil Fenburg (1)
		Crispin Little (1)
Editor Journal of Molluscan Studies	Dinazarde Raheem	Dinazarde Raheem
Editor The Malacologist	Georges Dussart	Georges Dussart
Treasurer	Katrin Linse	Katrin Linse (final year)
Membership Secretary	Harriet Wood (1)	Harriet Wood (2)
Hon. Secretary	Debbie Wall-Palmer (1)	Debbie Wall-Palmer (2)
Web manager	John Grahame	John Grahame (web)
Facebook manager	Chong Chen /John Grahame	Chong Chen/Victoria Sleight
Twitter manager	Chong Chen/ Lauren Sumner	Lauren Sumner Rooney
Awards Officer	Lauren Sumner Rooney (1)	Lauren Sumner Rooney (2)
Archivist	Andreia Salvador (1)	Andreia Salvador (2)

The number in parenthesis means ‘years in post’.
These years are limited as described in the objects of the Society

Report on the AGM virtual conference

Molluscan Tropical Biodiversity

Welcomed by the President of the Society, Jon Ablett
Hosted on Zoom on March 16th 2022



Morning Session

11.00: Introduction

11.15: **Dr Nur Leena Wong W.S.** Senior Lecturer,
Department of Aquaculture, Faculty of Agriculture, UPM
Head of Museum & Herbarium Unit, International Institute of Aquaculture & Aquatic Sciences (I-AQUAS), UPM, Port Dickson
Email: nurleena@upm.edu.my

Eating an undescribed species for 160 years - the problem with tropical cryptic species

A recently described oyster species which has been consumed locally in Malaysia for more than 160 years has brought to light the problem of cryptic species in the tropics. Using the example of several other cryptic slug species described in recent years, the talk emphasized the importance of international collaborations in the discovery of new species in the biodiversity rich tropical regions. The digitization of reference material provided by developed museums will greatly benefit developing nations in allowing access to museum collections and databases. Undescribed cryptic species have led to the underestimation of biodiversity in non-coral marine ecosystems. As there are few taxonomists in Southeast Asia, the puzzles of tropical cryptic species can only be solved through international collaborations.

Fig. Cryptic species *Sacoproteus smaragdinus* (top) and *S. nishae* (bottom) found coexisting in the same Caulerpa seaweed habitat.

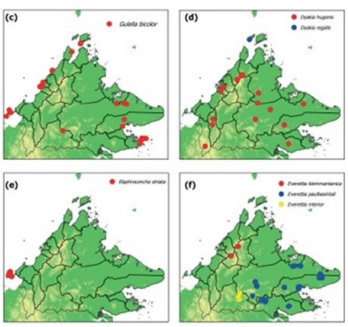
12.00: **Dr Liew Thor Seng**, Universiti Malaysia Sabah, Malaysia.
Email: throseng@ums.edu.my

Current status of land snail research in Sabah, Malaysian Borneo - what we have learned from two decades of work in Malaysia

Studies of the taxonomy and the processes that determine land snail diversity in Southeast Asia are still at an early stage despite nearly two centuries of malacological studies in the region. Until today, the species diversity of many groups of land snails from many places are yet to be described and documented. Nevertheless, a few groups of land snails have been studied in terms of their species diversity and distributions in this region. In this talk, I summarised 20 years of land snail studies in Sabah, Borneo by highlighting the described new species, the hotspot of species diversity, the biogeographical patterns, and the ecological and evolutionary processes that determine land snail diversity. Lastly, I discussed the challenges in land snail research in terms of availability of reference materials, research across country boundaries, publishing findings in scholarly journals and extinction of species based on what we have learned from two decades of work in Sabah.

Diversity of land snails in Malaysia

Sabah & Labuan (Vermeulen & Liew, 2022)



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12.45: AGM (all members welcome)

Afternoon Session

14.30: Introduction

14.45 Dr. Rebecca J. Rundell,
Associate Professor & Head Curator, Roosevelt Wild Life Collections
SUNY-ESF, State University of New York, Syracuse, New York USA
E-mail: rundell@esf.edu

Conservation and evolution of land snails in the lowland tropical rainforests of Belau (Republic of Palau, Oceania

Palaeopartula thetis

Anthropocene tropical forests will probably be smaller, simpler, steeper, and emptier. This point may arrive more quickly on small Pacific islands (Edwards *et al*., 2019; Cowie *et al*., 2022). Although Palau's lowland rainforest is relatively intact, it has suffered from both colonial and modern human activities such as increasing development along the Compact Road of the "big island" of Babeldaob, and limestone mining activity in unprotected areas. Fortunately, Palauans' recent conservation efforts and continuing interest in their forest biota (including land snails) are hopeful signs for the effective management, protection, and use of their forests. We have partnered with the Palau government and NGOs to discover new land snail species, uncover species relationships, understand microhabitat use in Palau land snail communities, and above all, share information that is valuable for forest protection. Expanding our knowledge of species' geographic distributions within and among islands underlies our current evolutionary and conservation research. Recent projects (e.g. by graduate students Teresa Rose Osborne, David Bullis, Jesse Czekanski-Moir, Emlyn Clark, and Brittany Leyda) focus especially on diplommatinids, punctoids, trochomorphids, and partulids, with the latter two land snail groups potentially benefiting from ongoing rat eradication projects with Island Conservation.

Palau from the air

15.30 Dr Vanessa L. Knutson
California Academy of Sciences,
55 Music Concourse Dr,
San Francisco, CA 94118 USA
Email: vknutson@gmail.com

Many species, but few names: phylogenetics and species delimitation of the (mostly) tropical nudibranch genus Gymnodoris

A selection of *Gymnodoris* species. Photo credits: V.L. Knutson, C. Pittman

The tropical Indo-West Pacific is characterized by great species richness across many taxa and nudibranch diversity is no exception. While nudibranchs are quite charismatic marine gastropods—many treasured for their bright color patterns and popular with many naturalists and malacologists—many genera continue to harbour much undescribed diversity. One such example is the genus *Gymnodoris*, which is widely distributed throughout this region. Phylogenetic analysis and species delimitation analyses based on standard Sanger-sequenced loci demonstrate that *Gymnodoris* is highly under-described, with about 81% of a current molecular dataset belonging to undescribed species. This work highlights the need for basic characterization of many tropical marine taxa, which is certainly exacerbated in taxa that are cryptic in their habitats. Intriguingly, *Gymnodoris* phylogeny indicates that a linear arrangement of gill filaments may have evolved several times within the genus, perhaps related to burrowing tendencies or to their nature as active predators of non-sessile prey—nonetheless more work is needed to fully characterize evolutionary patterns in this genus. In order to address compelling questions about the nature of evolution of these charismatic molluscs, and to help characterize tropical habitats that are under significant environmental pressures, evolutionary biologists and malacologists as a community need to better incentivise alpha taxonomy, especially for early career malacologists, and foster and support international collaborations to accelerate this crucial work.

For further information, see https://doi.org/10.1016/j.ympev.2022.107470

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16.15: Break

16.30: **Dr Christine Parent**,
Associate Professor, Biological Sciences
University of Idaho, Moscow, ID, USA
E-mail: ceparent@uidaho.edu

Drivers and constraints of diversification in Galápagos endemic land snails

Islands are ideal systems to track the evolutionary processes of diversification through time. In Galápagos endemic land snails, these processes have left a signature in the form of predictable patterns of phenotypic differentiation and community assembly over time.

As species accumulate via speciation and colonization on islands, biological communities increase in diversity and complexity, and species niche space becomes increasingly defined by a greater number of biotic dimensions whereas abiotic conditions remain the same across the archipelago.

In Galapagos, *Naesiotus* snails, phenotypic variation within species is found to be greatest on youngest islands and declines with island age, and this decline is tightly associated with the number of congeneric competitors found on each island. These results strongly suggest a pattern of increasing competition reducing phenotypic variation within species on older islands consistent with stabilizing selection.

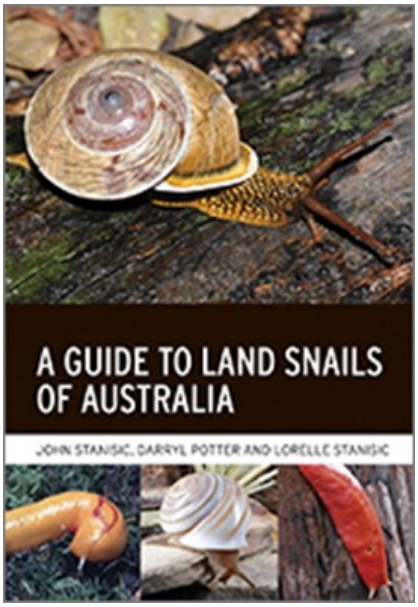
By reconstructing the evolutionary history of *Naesiotus* snails and characterizing phenotypic variation and environmental and ecological variation where species occur, it becomes possible to determine the effect of selection stemming from increasingly complex communities on the tempo and mode of phenotypic differentiation. Ultimately this work represents a first, critical step n understanding the influence of multidimensional selection on the rate and trajectory of phenotypic evolution in natural systems, where multidimensional niche space prevails.

***Naesiotus* tortuganus**

Book reviews

A Guide to Land Snails of Australia

Stanisic, J., Potter, D. & Stanisic, J.
2022. CSIRO Publishing, Melbourne. Pp: xii + 172.



If, like me, you are a professional malacologist, familiar with the land snail fauna of your own country, you have at your disposal learned monographs, original papers and national checklists. Your study shelves are full of these, and you access more online. You are familiar with museum collections and the arcane rules of scientific nomenclature. Go elsewhere, and you know how to home in on relevant work.

Now, though, you want to enthuse others with your passion; to help them to appreciate and identify the creatures that you have studied. You want more people to record snails, having identified them correctly. You want them to understand the contribution they make to biodiversity, and to be aware of the need for conservation.

I have on my shelves a host of books written to this end: from Cyprus, Czechia and Slovakia, Latvia, Portugal, Finland, Poland, Israel, the Netherlands and the UK. There are others. In each, there is an account of all the species known in each country. Most are in the range 250-350 pages; some are shorter. They deal with at most 200 species of land snail. Usually, there is room for much more information as background in addition to the means of identification.

Take larger areas, or more diverse faunas, and problems of size, cost and accessibility to the non-specialist arise. For Turkey, or for the vast territories of the ex-USSR, there are indeed single volume works, but with more than 700 species in each case, the presentation is stark, if taxonomically comprehensive.

For larger or richer areas still, problems become acute. F. Welter-Schultes' monumental work *European non-marine molluscs* (2012, Planet Poster Editions), deals with *ca.* 2500 land snail species. Comprehensive for certain, but with more than 700 pages of fine print, a considerable weight, and a hefty price tag, it is, like those for Turkey and the USSR, not for the casual user.

And so, we come to Australia, a continent more than two-thirds the size of all Europe (more than 7 million km^2). A continent as yet far short of having its land snail fauna fully described; a continent with many restricted endemics and huge differences in the faunas of its various regions; a continent with a mere 23 million people from which to draw a band of enthusiasts. Contrast this with 700 million in Europe.

Australia has a rich snail fauna. 1500 species have been described, and there are probably at least 1000 more to be dealt with. Nevertheless, two of the authors of this *Guide to Land Snails of Australia* have, with others, provided details of the whole fauna, lavishly illustrated, in two volumes (Stanisic, Shea, Potter & Griffiths, 2010, 2018) each dealing with nearly 800 species in nearly 600 pages. As with Welter-Schultes' work, these are necessarily both weighty and expensive. Not on every naturalist's bookshelf.

What to do? Here is the Australian answer: a short book, well-illustrated, designed to whet the appetite, and to provide some of the basic, background information about land snails as a group. It has ten full chapters, ranging from a history of molluscan study, through aspects of snail biology and their place in the environment to the more practical aspects of collecting, identification and uses (a final chapter is an entertaining and educational account of human uses, not all of which are gastronomic). Three central chapters give a brief account of each family (beautifully illustrated with images of live animals), the snail species introduced into Australia, many of which are pests, and a tour around no less than 37 regions, each with a distinctive fauna. Surely, this is a vital point, directing attention to faunas accessible locally to people living in such a vast country. At the end, there is a listing of families, a glossary, references and further reading, and an index to both scientific and vernacular names.

The book has several outstanding features. Top of my list are the magnificent images of live snails, nearly all with locality data and an indication of size. To my chagrin, having visited both the Kimberley in the far north-west, and the forests of north-eastern New South Wales and south-eastern Queensland, there are few that I have encountered which is a testimony to the huge diversity of which these images show a mere fraction.

The style is clear and easy-going, with a minimum of obscure technicalities. Six "boxes" take time out to focus on topics that deserve that little extra detail, each conveying some important idea that may shape the reader's thinking. As an overview of a rich fauna, still not fully catalogued, it does its job. Both visiting and local malacologists would benefit from reading it before they started to explore.

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However, if inevitable, this is not a guide to identification at the species level, despite the chapter on identification and the glossary of terms. There is no short cut here. Scanning electron micrographs of protoconchs are beyond the means or ability of most, and dissection must be much the same for the beginner. In effect, the chapter tells you how the experts go about it. Perhaps wisely, there is no mention of molecular taxonomy, nor of the labyrinthine world of scientific nomenclature. Species are accorded both scientific and vernacular names.

There are some minor niggles. The plates illustrating shells typical of each family suffer from a lack of scale, although the range of size is given in the chapter devoted to brief accounts of each family. Operculate snails could have done with an illustration early on (p. 13), including the operculum. The illustration of genitalia (p. 21) does not feature the ovotestis. The word "denizens" is misused (p. 31).

This book is an interesting experiment. In a single country that is also a continent with a rich and only partly described snail fauna, there can be no simple, single-volume guide such as those produced for much smaller European nations. As the authors demonstrate, however, many endemic species are at risk. If this book raises awareness of these risks, and of the beauty and diversity that may be lost, it will have served its primary purpose. While I am a little shocked by the price, quoted as £ 39.95 in the UK, it will surely be required reading for malacological visitors to that intriguing country.

References

Stanisic, J., Shea, M., Potter, D. & Griffiths, O. 2010. *Australian Land Snails. Volume 1: A Field Guide to Eastern Australian Species.* Bioculture Press, Mauritius.

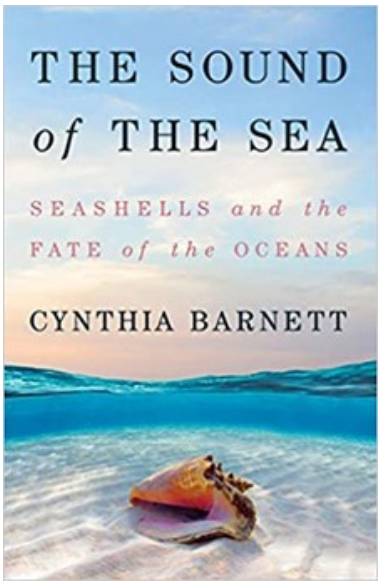
Stanisic, J., Shea, M., Potter, D. & Griffiths, O. 2018. *Australian Land Snails. Volume 2: A Field Guide to Southern, Central and Western Species.* Bioculture Press, Mauritius.

Robert Cameron (Professor)

The Sound Of The Sea

Cynthia Barnett

W. W. Norton & Company, New York
2022 ISBN 978-0-393-65144-7 (Hardback), 417pp.



Humans have had a long association with molluscs and their shells, and in this newly published book, Cynthia Barnett explores this varied association. The structure of the book is refreshingly different. The narrative of each of the 13 main chapters is woven around a particular species that is illustrated by a full page pencil sketch at the beginning of the chapter (these are the only illustrations). Most of the molluscan examples, chosen as the nucleus for each chapter, are gastropods with only two chapters (three the introduction is included) allocated to bivalves. However, other shelled molluscs such as the chambered nautilus do make appearances in the book. The book covers a great deal of ground in which the author looks at historical aspects related to the collecting and trading of shells, general uses of shells (e.g. money, adornments, tools, musical instruments, building material), cultural and religious uses of shells, as well as the effects of over exploitation and climate change[1] (pollution, ocean acidification, global warming) on molluscs. Thus the disciplines of archaeology, anthropology, environmental science and biology all feature in the book.

Also included are revelations of how shell deposits of archaeological value have been plundered or destroyed by humans. Throughout the book, Cynthia Barnett includes information from discussions with some well-known authorities on molluscs, as well as life-story information about some of these scientists, shell collectors and traders (e.g. the origin of the Shell Oil company began as a family business importing exotic shells), as well as some unsung and therefore generally unknown contributors to shell collections and drawings, and research. The book is an interesting read, and although there is little scientific detail on molluscs, I would recommend it to established malacologists and conchologists. I would also recommend the book to students whose study animals are molluscs because, in their training, they may not have been exposed to fascinating historical and archaeological aspects of conchology. Unfortunately at £18.99 in hardback, I am not sure that many students will purchase the text. Perhaps it will soon be available in softback?

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I detected only a few errors in the book (e.g. proof reading error on page 303, *Tridacna gigas* is said to release 500 eggs during spawning - the vital word 'million' is missing). The writing style is conversational, and at times the author does include imaginative embellishments more typical of a work of fiction. One or two sections of the book read rather like a travelogue.

After reading the book I was left with the impression that it is aimed at the American market (the author is USA based). I reached this conclusion for a number of reasons. Many of the exemplar species used as a basis for the theme(s) of each chapter are from American waters. Settings are also often American biased. Florida and Sanibel Island, for example, are prominent in the narratives. Most of the malacologists/conchologists consulted, interviewed, or indeed given prominence in the book are also American. All measures and weights are those used in the USA (e.g. weight in pounds), and not metric. Finally, when trying to give the reader some idea of scale, the author sometimes compares size to that of a nickel or dime coin (I wonder how many people from outside the USA know how big these coins are?). Nevertheless, do not let this put you off reading it. The research that has gone into the book is impressive, the author does include narratives based around visits to the Maldives and Ghana and the issues covered using the chosen shelled examples are globally relevant. The book also contains, at the end, a useful set of notes for each chapter including references for further reading.

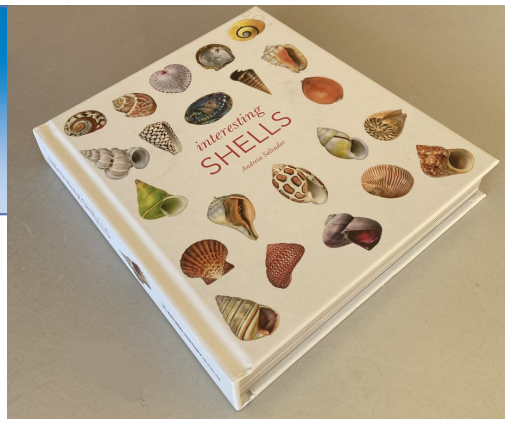
As an endnote the author's main title for the book – *The Sound of The Sea* – is not unique. The title is the same as a 2005 children's book written by the Australian author Jacqueline Harvey and illustrated by Warren Crossett, as well as a 19th century poem by Henry Wadsworth Longfellow.

[1]The book is fittingly published in the year in which we had COP26

Alan Hodgson (Emeritus Professor)

Interesting Shells

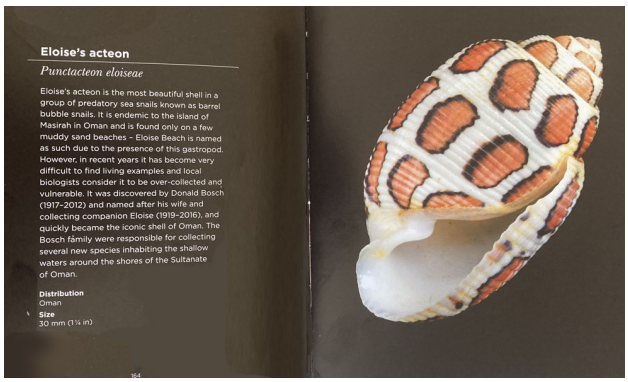
Andreia Salvador
Natural History Musum, London



This pretty little book uses the extensive resources of the Natural History Museum of London (NHM) to present photographs and supporting information for a range of mollusc shells. The author is Senior Curator of Mollusca at the NHM and for each shell, the photograph is supported by a short, accessible description of features of interest.

The book opens with a clear description of the general biology of molluscs, arranged by systematic class. The contents are then organised so that the photograph is on one page and the accompanying text is on the facing page. The photographic quality is excellent; because of the size of the object (the shell) it is not easy to make sure that the whole shell is in focus for a photograph, but this has been achieved here. None of the photos show sections of the shells. Colours are realistic, and of a consistent quality throughout the book. Confusing backgrounds are omitted so the reader gets a feeling for the true architecture and colour of the shell.

The accompanying text is well-written and clear so that a non-specialist could understand it. The text includes brief information on the size and distribution of the mollusc. The concise text adds to the value of each image and prevents this from being a mere picture book. There is a conundrum however, because the text is often about the living animal and the photographs show the beautiful but lifeless shell. At some point in the future, an author will produce a similar book showing the living, crawling or floating animal.

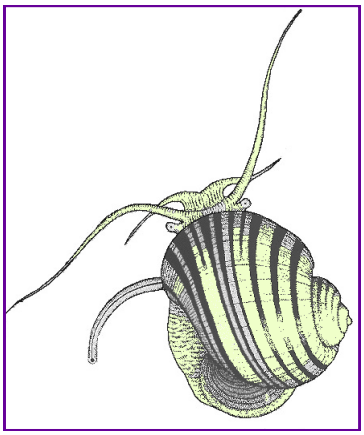


At 256 pages, the book is a perfect length. It will mainly be enjoyed by non-specialists but as a freshwater malacologist, I appreciate having a marine/terrestrial shell book on my shelf. It feels a bit foreign, and I have enjoyed exploring the unfamiliar territory through which it guides me. *Interesting shells* would make a lovely gift for an enthusiastic biologist of any age, and if no one thought to gift me a copy, I'd gladly pay the retail price of £12.95 for the hardback. And the reader wouldn't need to be a biologist; anyone with a sense of beauty and aesthetics would be moved to see what natural selection has achieved in the composition, form and colour of these shells. The objective of the book seems to be to grab the reader's attention with an illustrated review of the range and beauty of a limited number of shells held by the NHM. This objective seems has been beautifully and economically achieved.

Georges Dussart (Emeritus Professor)

The Malacological Society of London
WWW.MALACSOC.ORG.UK

Molluscan Forum



Thursday 17th November 2022
9.00 – 6.30
Flett Lecture Theatre
Natural History Museum, London

CALL FOR REGISTRATIONS AND PAPERS

This informal, annual, and successful meeting is designed to bring together people starting their research on molluscs, to give them the opportunity to present and discuss their work and to compare notes on methods and problems.

Attendance at the Molluscan Forum is open to all, but presenters should be **research students, post-doctoral researchers, undergraduate students** starting molluscan projects, and **amateurs** engaged in substantial projects that have not yet been published. Any topic related to molluscs is acceptable: palaeontological, physiological, behavioural, ecological, systematic, morphological, cellular, or molecular.

Short talks (~12 minutes) or posters may be offered. They need not be polished accounts of completed work; descriptions of new methods, work in progress, and appeals for assistance with unsolved problems are equally acceptable.

With a hybrid format this year we will have two virtual sessions (with limited space) to give those unable to travel to London a chance to present their work. Posters will all be presented in person.

THERE IS **NO** REGISTRATION FEE.

Enquiries and registrations to:
Phil Hollyman, British Antarctic Survey (phyman@bas.ac.uk)

Non-presenters:
Virtual attendance of talk sessions for non-presenters will be possible (poster sessions will be in person), so please indicate whether you will be attending in person or virtually. Please let us know you will be coming so that we can estimate numbers.

CONTINUED >

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Molluscan Forum, Thursday 17th November 2022
9.00 – 6.30
Flett Lecture Theatre, Natural History Museum, London

REGISTRATION FORM

Return before 1st October 2022, by email to:

Phil Hollyman, British Antarctic Survey (phyman@bas.ac.uk)

Name.....……

Institute.....……..…

.....……

Email.....…….....

Status: Research Student / Undergraduate / Post-doctoral researcher / amateur (delete as appropriate)

'Other' (please state) ……..

I wish to give a talk / poster (delete as appropriate) entitled:

.....……

.....……..

I would like to present in person / remotely (talks only). Delete as appropriate.

Please attach, as a Microsoft Word attachment, an abstract of not more than 350 words TOGETHER WITH TWO .JPG IMAGES IN SUPPORT OF THE ABSTRACT. Abstracts and images of accepted contributions will be published in the Society's on-line bulletin which is called *The Malacologist. The Malacologist* has an ISSN number and is published and archived on the website of the MSL. Articles are citable

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Abstract submission

Abstracts submitted for the Molluscan Forum should be sent as Microsoft Word files.

Please use the following format:

Title (12pt, centred)
<blank line>
Authors (10 pt, centred, presenting author underlined; use superscript numbers to indicate institutional affiliation)
<blank line>
Institutions (10pt, centred; in this order: Number (superscript), Department, Institution, City, Country)
Presenting Author email
<blank line>
Abstract (11pt, no indentation, justified, 350 words maximum)

EXAMPLE ABSTRACT

The Geographic Scale of Speciation in *Stramonita* (Neogastropoda: Muricidae)

Martine Claremont[1,2], Suzanne T. Williams[1], Timothy G. Barraclough[2] and David G. Reid[1]

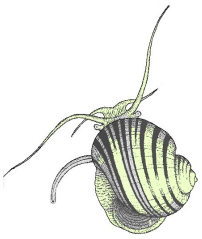
[1]Department of Zoology, Natural History Museum, London, UK
[2]Department of Biology, Imperial College London, Berkshire, UK
Email: m.claremont@nhm.ac.uk

Stramonita is a relatively small, well-defined genus of muricid marine gastropods limited to the tropical Eastern Pacific and the Atlantic. The type species, *S. haemastoma*, is known to have teleplanic larvae and is estimated to remain in the water column for several weeks. *Stramonita haemastoma* shows regional variation, and this has led to the recognition of five geographical subspecies: *S. h. haemastoma*, from the Mediterranean and Eastern Atlantic to Brazil, *S. h. floridiana*, on the east coast of Florida and in the Eastern Caribbean, *S. h. caniculata* on the west coast of Florida and the Gulf of Mexico, *S. h. rustica* in the Western Caribbean and *S. h. biserialis* in the Eastern Pacific. The protoconch has been shown to be similar across the *S. haemastoma* complex, implying that all subspecies have equally long lived larvae. Within these subspecies, cryptic variation is suspected. For example, *S. h. biserialis* is suggested to be differentiated North/South on a small scale. In the presence of teleplanic larvae, speciation on such a small scale seems paradoxical. Various explanations for this paradox are possible. Actual (or realized) dispersal of *Stramonita* species may be more limited than presently believed, leading to allopatric differentiation. Alternatively, morphological differentiation may not be a reliable indicator of genetic differentiation, and *S. haemastoma* (*sensu lato*) might indeed prove to be a single taxa. It is also possible that ecological speciation could result in geographical speciation on a small scale in the presence of wide dispersal. My results suggest that five species of *Stramonita* are present in the Caribbean, at least three of which occur sympatrically. Gene flow is maintained between Caribbean and Mediterranean populations in at least one species, while no genetic differentiation was found along the Eastern Pacific coast. The implications of these results are discussed.

Grants and Awards

Malacological Society of London Awards and Grants

Please note! The Society is currently trialling a new Travel awards schedule, to better align with the academic seasons.



Travel Grants are available as bursaries to support attendance at a conference or workshop relevant to malacology. Grants are preferentially conferred on students and researchers without professional positions. The maximum amount for one of these awards is **£500 for Society members and £300 for non-members**; the Society anticipates that at least **five awards** will be made annually. The application should have the support of the project supervisor. In years when a UNITAS Congress is held, a number of these awards will probably be used to support participation at this meeting.

There are now two closing dates each year, **1st March** for travel awards starting between 1st June and 30th November of the current year, and **1st September** for travel starting between 1st December of the current year and 31st May of the following year. You must apply to the correct round of awards. https://malacsoc.org.uk/awards-and-grants/travel-grants/

Your application should have the support of your project supervisor; please ask your supervisor to complete question 7 and sign and date the form. Please note that the supervisor's comments make an important contribution to the decision making process and should provide sufficient detail about the applicant and the benefits expected from their travel. Note that it is your responsibility to ensure contact details are provided by the supervisor. The Society will not contact supervisors on your behalf.

Submission of your application

Please submit your signed and completed application by email to the Honorary Awards Secretary at MSL_awards@nhm.ac.uk, with "Travel Award Application" and your surname in the subject title. If you are unable to scan the file with your supervisor's signature, please ask them to email their support to the Honorary Awards Secretary.

The Society **does not accept** applications for support in arrears, i.e. after travel has taken place. Applications for travel scheduled between June and November must be submitted in advance and by the 1st March, and for travel scheduled between December and May must be submitted in advance by the 1st September.

Conditions

The Society is trialling upfront payments of travel awards to alleviate financial pressure on recipients. Recipients of Travel Awards will be asked to provide evidence of attendance at the event for which funding was sought, and if travel does not take place, recipients commit to repaying their award.

Recipients are also requested to acknowledge the financial support of the Society on posters or during oral presentations.

Any enquiries should be directed to the Honorary Awards Secretary at MSL_awards@nhm.ac.uk

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The Research Awards Scheme was established to commemorate the Society's Centenary in 1993. Under this scheme, the Society gives awards to support research on molluscs that is likely to lead to publication. Grants are preferentially conferred on students and researchers without regard to nationality or membership of the Society. Preference is also given to discrete research projects that fall within the subject areas covered by the Society's *Journal of Molluscan Studies*. Applications will be assessed by scientific merit, value of the project and for student applicants, the extent to which the research will benefit the applicant's scientific aspirations. Awardees are encouraged to publish their work in the *Journal of Molluscan Studies* (full papers) or *The Malacologist* (travel award reports, research award reports, news of ongoing research etc) as appropriate,

Early Career Research grants

Eligibility is restricted to those investigators at the outset of their independent scientific career. Applications must therefore be 1) postgraduate students, 2) within five years of being awarded their PhD (adjustable for career breaks), or 3) independent researchers not having a PhD. Early Career Research Grants will only be awarded to individuals twice, but not within 3 years of receiving a first award. The closing date for applications each year is the 15th December. The successful applicants will be notified by 31st March and announced at the Annual General Meeting. From 2021, the Society will award additional grants to applicants who also wish to be considered for an **Equity & Inclusion** award (open to UK/EU applicants from historically excluded backgrounds) or a **Global Development** award (open to applicants from developing and transition nations, following UN definitions).

Sir Charles Maurice Yonge Award

Successful applications to the Early Career Research Grants scheme or Travel Awards that are concerned with the study of Bivalvia may be awarded as Sir Charles Maurice Yonge Awards

Senior Research Awards

These awards are aimed at established researchers in professional positions, but without regard to nationality. Applicants for Senior Research Awards must be members of the Malacological Society of London. The Society currently awards up to five Senior Research Grants per year, each with a value of up to £1,500, to support research on molluscs that is likely to lead to publication. The maximum amount available should not be considered as a 'target'; rather, requests should reflect the research that is proposed. The grants are reviewed by a Reviewers Panel including both Council and, if required, non-Council members invited for that purpose.

Travel Grants

Travel Awards are available as bursaries to support attendance at a conference or workshop relevant to malacology. Grants are preferentially conferred on students but researchers without professional positions may also apply. The maximum amount for one of these awards is £500 for Society members and £300 for non-members. Preference will be given to members of the Society. There are now two closing dates each year, **1st March** for travel starting between 1st June and 30th November of the current year, and **1st September** for travel starting between 1st December of the current year and 31st May of the following year.
For further information, guidance notes and to access the application form see here - http://malacsoc.org.uk/awards-and-grants/travel-grants

Annual Award

This Award is made each year for an exceptionally promising initial contribution to the study of molluscs. This is often a thesis or collection of publications. The value of the Award is £500. Candidates need not be a member of the Society but must be nominated by a member. There is no application form: the nominating member should send the material for evaluation with a covering letter or letter of support to the Honorary Awards Secretary. The closing date each year is 1st November. The winner(s) will be notified by 31st March, and announced at the Annual General Meeting.

Applications

Applications for Research Awards and Travel Grants should be sent to the Honorary Awards Secretary at MSL_awards@nhm.ac.uk. For further information, guidance notes and to access the grant application form see http://malacsoc.org.uk/awards-and-grants/research-grants
Please note that all applications must be sent by email to MSL_awards@nhm.ac.uk.

Malacological Society of London—Membership notices

Objects

The objects of the Society are to advance education and research for the public benefit by the study of molluscs from both pure and applied aspects. We welcome as members all who are interested in the scientific study of molluscs. There are Ordinary Members, Student Members and Honorary Members. Members are entitled to receive a digital copy of the *Journal of Molluscan Studies* and such circulars as may be issued during their membership. The society's Web Site is at:

http://www.Malacsoc.org.uk

Publications

The Society has a continuous record of publishing important scientific papers on molluscs in the *Proceedings*, which evolved with Volume 42 into the *Journal of Molluscan Studies*. The *Journal* is published in annual volumes consisting of four parts which are available on -line by members and student members. The Society no longer produces paper copies of the Journal. Members also receive access to *The Malacologist*, which is the bulletin of the Society, issued twice a year, in February and August. *The Malacologist* is published on-line. on the website of the Society.

Meetings

In addition to traditional research on molluscan biology, physiological, chemical, molecular techniques are amongst the topics considered for discussion meetings and papers for publication in future volumes of the *Journal*.

Subscriptions

Membership fee structure

Ordinary Members: Journal on-line only £45
Student Members: Journal on-line only £25

Methods of Payment

(1) Sterling cheque to "The Malacological Society of London".

(2) Banker's standing order to: HSBC (Sort code 40-16-08 Account no. 54268210) 63-64 St Andrew's Street, Cambridge C32 3BZ

(3) Overseas members wishing to pay electronically should should use

IBAN GB54MIDL4016084268210

SWIFT/BIC MIDL GB22

(4) Credit card: Overseas members ONLY may pay by credit card: the Society can accept VISA and MasterCard payments only. Please provide the Membership Secretary with your card number and expiry date, card type (VISA or MasterCard.), the name on the card, and the cardholder's address (if this differs from your institutional address). Receipts will only be sent if specifically requested.

Institutional Subscriptions to the Journal

Enquiries should be addressed directly to Oxford University Press, Walton Street, Oxford OX2 6DP, U.K.

Change of Member's Address

Please inform the Membership Secretary of a change of postal or email address

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APPLICATION FOR MEMBERSHIP OF THE MALCOLOGICAL SOCIETY OF LONDON

I wish to apply for (please mark your choice) :-

Ordinary Members: Journal on-line only £45

Student Members: Journal on-line only £25

I enclose a cheque payable to "The Malacological Society of London" for my first annual subscription.

Title .... Name .....

Department ..... Institution .....

Street ..... City .....

Post /Zip Code ..... Country ..... Email .....

Malacological Interests .....

Signature ..... Date .....

Please send the completed form and cheque to the Membership Secretary:

Harriet Wood,
Curator & Collections Manager, Amgueddfa Cymru, National Museum Cardiff, Cathays Park, Cardiff, CF10 3NP

REGISTERED CHARITY NUMBER: 275980

REPORT OF THE TRUSTEES AND UNAUDITED FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2021 FOR THE MALACOLOGICAL SOCIETY OF LONDON

Staffords
Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
Oakington Road, Girton
CAMBRIDGE
Cambridgeshire
CB3 0QH

THE MALACOLOGICAL SOCIETY OF LONDON

CONTENTS OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2021

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2021

The trustees present their report with the financial statements of the charity for the year ended 31 December 2021. The trustees have adopted the provisions of the Charities SORP (FRS102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

STRUCTURE, GOVERNANCE AND MANAGEMENT

Governing document

The charity is controlled by its governing document, a deed of trust, and constitutes an unincorporated charity.

The governing document is continually reviewed following its original adoption on 17 May 1978, with the current operative revision of the governing document being that amended on 28 April 2005.

Recruitment and appointment of new trustees

Nominations for Council (the board of related party) from members must be proposed and seconded and in the hands of the Secretary by December 31st. Members at the AGM 2016 proposed and seconded that only the Society's President and Officers (Treasurer, Secretary, Membership Secretary, Awards Secretary) are forming the board of trustees. It shall be the duty of Council to nominate members for election to the offices of President, Treasurer, Secretary, Membership Secretary, Editor of the Journal, Editor of the Bulletin, Archivist, Web Manager, and Awards Secretary, and for the vacancies in the Council caused by annual retirement. Nominations from the members and from Council shall be submitted to the Society with the notice convening the Annual General Meeting which shall be sent to every member of the Society not less than fourteen days before the Meeting.

In the case of a vacancy arising in any office of the Society, or in the Council, other than by way of resignation or retirement in the Annual General Meeting, the Council shall have power to appoint a temporary Council member to that vacancy until the next Annual General Meeting.

Risk management

The trustees have a duty to identify and review the risks to which the charity is exposed and to ensure appropriate controls are in place to provide reasonable assurance against fraud and error.

In particular:

(a) Admission fees and annual subscriptions shall be such sums as may be determined by a Special General Meeting convened under Rule VI(c), or at the Annual General Meeting.

(b) Subscriptions shall be due on the 1st of January in each year; but in the case of a new member, immediately after election. Members elected during the months of November and December, however, shall not be required to pay for the year in which they are elected.

(c) Any member whose current subscription has not been received in full by 31 January shall be reminded of the arrears in subscription and be informed that despatch of the Journal is suspended until the arrears are paid. No member whose subscription is twelve months in arrears shall be entitled to any of the privileges of the Society, and any member whose subscription is two years in arrears shall cease to be a member of the Society, unless the Council decide otherwise.

(d) The Council shall revise and publicise the conditions of the Society's awards and grants from time to time.

(e) For the purpose of legal protection of the property of the Society, all funds, books and other property shall be declared vested in Council as the Society's Trustees.

(f) The Council shall cause to be kept Minutes of Council and Society Meetings and books of account in respect of all receipts, payments, assets and liabilities. Accounts shall be presented to each Annual General Meeting for approval by members and such accounts shall be audited or independently examined as appropriate.

OBJECTIVES AND ACTIVITIES

Objectives and aims

The governing document contains the following in relation to the objective of the charity:

The objects of the Society are to advance education, research and learning for the public benefit in the study of molluscs from both pure and applied aspects. In furtherance of these objects, but not further or otherwise, the Society shall have the following powers:

(a) To promote and co-ordinate meetings and symposia,

(b) To promote and co-ordinate research both pure and applied;

(c) To provide for the worldwide dissemination of the useful results of such research by publication of the Journal of Molluscan Studies;

(d) To award prizes to outstanding students in the field of molluscan biology;

(e) To award research grants to individuals which will advance the study of molluscan biology;

(f) To do all such things as will further the objects of the Society.

Significant activities

In 2021 the Malacological Society of London held a virtual AGM meeting with the online symposium “Molluscs in Extreme Environments”, and the annual Molluscan Forum for Young Scientists was also held virtually. The Society published the members' bulletin "The Malacologist" and in cooperation with Oxford University Press "Journal of Molluscan Studies".

Public benefit

The charity's objects are for the public benefit because increasing public knowledge is required as they form an important part of the global biodiversity and ecosystem stability which can have effects on human health and are a human food source.

ACHIEVEMENT AND PERFORMANCE

Charitable activities

In 2021 the main charitable activities were the funding of seven ECR and three SCR research projects, of which all claimed, additionally to one 2020 ECR claiming their grant late and one 2020 ECR returning their grant (total cost of £13,948) and the support of one student to attend conference, an activity highly impacted by Covid-19 as the Society usually supports around 20 scientists here.

FINANCIAL REVIEW

The finances of the Malacological Society have been pleasing during 20201 with an overall gain of £73,378. This gain is explained by a gain in the Investment fund and lower awards and meeting expenditure.

Our investments had an overall gain of £41,202 (comparing market value at 31 December 2021 with market value at 31 December 2020), with the COIF Investment Fund making a gain of £49015 and the COIF Fixed Interest Fund a loss of £7814. During 2021, no funds were transferred from the current account to savings accounts.

Separately, the profit-share from the publication of the Journal of Molluscan Studies in 2021provided the Society with most of its income contributing £48,035. The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal. In addition, sales of the digital archives provided £2,454 of income.

In 2021, a little more funds were used for research awards, being £13,948 in 2021 compared to £12,262 in 2020, while travel awards significantly dropped pandemic related, but there was reduced spending on Council meetings and Forum travel awards as meetings were held virtually. The Society (MSL) spent less money in 2021 compared to 2020, this was mainly based on less expenses paid for meetings and to OUP for color plates since JMS moved to online only.

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2021

REFERENCE AND ADMINISTRATIVE DETAILS

Registered Charity number
275980

Principal address
c/o British Antarctic Survey
High Cross
Madingley Road
CAMBRIDGE
CB3 0ET

Trustees

J Ablett	President, elected 24th March 2021, ex-Awards Officer
Dr H Wood	Membership Secretary
Dr K Linse	Hon. Treasurer
Dr Debbie Wall Palmer	Hon. Secretary, elected 24th March 2021
Dr Lauren Sumner Rooney	Awards Officer, elected 24th March 2021
Dr J Grahame	Ex- President, term ended 24th March 2021
Dr R Whittle	Ex-Hon. Secretary, term ended 24th March 2021

Independent examiner
Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Approved by order of the board of trustees on ..... and signed on its behalf by:

.....
Jonathan Ablett - Trustee

INDEPENDENT EXAMINER'S REPORT TO THE TRUSTEES OF THE MALACOLOGICAL SOCIETY OF LONDON

I report on the accounts for the year ended 31 December 2021 set out on pages five to ten.

Respective responsibilities of trustees and examiner
The charity's trustees are responsible for the preparation of the accounts. The charity's trustees consider that an audit is not required for this year (under Section 144(2) of the Charities Act 2011 (the 2011 Act)) and that an independent examination is required.

It is my responsibility to:

- examine the accounts under Section 145 of the 2011 Act
- to follow the procedures laid down in the General Directions given by the Charity Commission (under Section 145(5)(b) of the 2011 Act); and
- to state whether particular matters have come to my attention.

Basis of the independent examiner's report
My examination was carried out in accordance with the General Directions given by the Charity Commission. An examination includes a review of the accounting records kept by the charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and seeking explanations from you as trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit, and consequently no opinion is given as to whether the accounts present a 'true and fair view ' and the report is limited to those matters set out in the statements below.

Independent examiner's statement
In connection with my examination, no matter has come to my attention:

(1) which gives me reasonable cause to believe that, in any material respect, the requirements

- to keep accounting records in accordance with Section 130 of the 2011 Act; and
- to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the 2011 Act

have not been met; or

(2) to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Date: .....

The Malacological Society of London

Statement of Financial acitivities (incorporating an income and expenditure account) for the year ended 31st December 2021

Note			TOTAL 2021	TOTAL 2020
	INCOMING RESOURCES			
	Income from Activities of the Charity			
	Members' Subscriptions: Current Year		2,205	1,670
	Collection of Subscription Arrears		-	-
4	OUP: Income from Journal Publication		48,035	48,890
2	Income from sale of Digital Archive		2,454	507
	Sundry Income		105	66
	Donations		-	-
	Income from Investments			
3	Interest	CCLA	0	6
3	Dividends		3,181	3,706
	TOTAL INCOMING RESOURCES		**55,980**	**54,844**
	RESOURCES USED			
	Awards			
	Annual Award		-	-
	WCM Award		-	-
7	Research Awards (Early career & Senior)		13,948	12,262
	EuroMal 2020 award		-	-
			-	-
7	Travel Bursaries for conferences		300	1,050
5,6	Travel awards: AGM		-	1,240
5,6	Travel awards: Forum		-	-
			14,248	**14,552**
	Directly Relating to Work of Charity			
4	Journal expenses		4,524	4,637
4	Journal colour plates		1,080	8,280
4	Journal editor expenses, incl meetings		1,624	1,644
5	Malacologist Expenses		286	41
6	Meeting Expenses		300	358
	Independent examiners expenses		1,188	1,128
5,6	Council Meeting travel expenses		-	738
	Web sites		-	-
5	Postage, Printing & Stationary		446	-
	Charges for cc subscription collection		36	18
	Bank charges		132	222
	Sundries		-	4
	Total		**23,863**	**31,621**
	NET INCOME		**32,117**	**23,223**
8	GAIN ON REVALUATION OF FIXED ASSETS		41,202	28,997
	NET MOVEMENT IN FUNDS		73,319	52,220
	TOTAL FUNDS BROUGHT FORWARD		443,310	391,090
	TOTAL FUNDS CARRIED FORWARD		**516,629**	**443,310**

CONTINUING OPERATIONS

All income and expenditure has arisen from continuing activities.

The Malacological Society of London

Balance Sheet at 31 December 2021

Note		2021	2020
		£	£
	FIXED ASSETS	**441,821**	**400,619**
8	Tangible Assets		
	CURRENT ASSESTS		
11	Debtor	-	-
9	Cash at Banks	87,996	55,819
10	CREDITORS: (Amounts falling due within one year)	- **13,188**	- 13,128
	NET CURRENT ASSETS	**74,808**	**42,691**
	TOTAL NET ASSETS	**516,629**	**443,310**
	FUNDS		
	Unrestricted (Designated):		
11	Annual Award Fund	6,500	6,500
11	CM Yonge Award Fund	9,250	9,250
11	Centenary Research Award Fund	80,000	80,000
		95,750	95,750
11	General reserve Fund	420,879	347,560
	TOTAL FUNDS	**516,629**	**443,310**

Katrin Linse
Honorary Treasurer & Trustee

Dated

Jonathan Ablett
President & Trustee

Dated

The Malacological Society of London

Notes to the Financial Statements for the year ended 31st December 2021

1. ACCOUNTING POLICIES

Basis of Preparing the Financial Statements

The financial statements have been prepared in accordance with the Charities SORP (FRS 102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

- The SORP normally requires a columnar fomat, in this entities case the trustees' view is this is not appropriate as there are neither restricted funds nor endowment funds and so all of the activity in the year would fall within the unrestricted fund column.

Accounting Convention

The financial statements have been preprared under the historical cost convention, except for those items described immediately below.

- The historic cost basis of accounting is used except for investments, which have been included at their market value where readily available at the yearend date.

Going concern

The Trustees consider that there are no material uncertainties about the charity's ability to continue as a going concern.

Reconciliation with previously Generally Accepted Accounting Practice

In preparing the accounts, the trustees have considered whether in applying the accounting policies required by FRS102 and the Charities SORP FRS 102 the reinstatement of comparative items was required. In the case of this charity, no changes were made.

Fund accounting

- The Society funds, including funds available for awards, are not subject to any restrictions regarding their use, and are available to be used for the general purposes of the Charity. Consequently they are classified as 'Designated Funds'.

Taxation

- The charity is exempt from tax on its charitable activities.

Significant judgements

Apart from those judgements involving estimations, the management has not made any judgements in the process of applying the entity's accounting policies that have significant effect on the amounts recognised in the accounts. There are no key assumptions concerning the future or other key sources or estimation uncertainty at the reporting date that have significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next reporting period.

Financial reporting standard 102 - reduced disclosure exemption

The charity has taken advantage of the following disclosure exemption in preparing these financial statements, as permitted by FRS 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland':

- the requirements of Section 7 Statement of Cash Flows

Resources Expended

Expenditure is accounted for on an accruals basis and has been classified under headings that aggregate all cost related to the category. Where costs cannot be directly attributed to particular headings they have been allocated to activities on a basis consistent with the use of resources.

Incoming Resources
All income is recognised in the Statement of Financial Activities once the charity has entitlement to the funds, it is probable that the income will be received and the amount can be measured reliably.

Foreign currencies
- Asessts and liabilities in foreign currencies are translated into sterling at the rates of exchange ruling at the balance sheet date. Transactions in foreign currencies are tranlated into sterling at the rates of exchange ruling at the date of transaction. Exchange differences are taken into account in arriving at the operating result.

Incoming Resources and Resources used
· Subscriptions for annual membership are treated as follows:

Pre-paid in prior year	Liabilities
Paid in current year	Incoming Resource: subscriptions
Unpaid at 31st December	Not included in accounts. No debtor
Subsequently recieved	Incoming Resource: collection of subscriptions in arrears

· The costs of the Society Journal and supplements are written off in the year of initial distribution.
· The Profit Share from Oxford Journals is included in the year of receipt and not accrued.
The amount of Profit Share cannot be determined accurately by OUP until after the Society's AGM.

2. SALE OF THE DIGITAL ARCHIVE BY OUP
Since 2010 the sale of the digital archives by OUP has generated a windfall profit of £13,969 in 2010, £9,284 in 2011, £7,299 in 2012, £10,068 in 2013, £7,827 in 2014, £10,590 in 2015, £2,805 in 2016, £10,429 in 2017, £4,238 in 2018, £1,352 in 2019, and £506 in 2020.
Although the main customers for this product have now purchased the archive and OUP has split archive sales into subjects, digital archive sales are still ongoing with £2,454 in 2021.

3. INTERESTS & DIVIDENDS
Income has been derived from the following sources and has been applied to funds as indicated:

		2021	2020
		£	£
Sources	COIF Deposit Fund Interest	-	6
	COIF Fixed Interest Fund Dividend	3,181	3,706
	COIF Investment Fund Dividend		
		3,181	**3,718**
Beneficiary	Revenue Fund	1,010	1,181
	Annual Award Fund	166	194
	CM Yonge Award Fund	234	273
	Research Grants other Funds	1,771	2,070
		3,181	**3,718**

4. JOURNAL The surplus resulting from publication of the Journal is as follows

	2021	2020
	£	£
Profit Share from OUP	50,489	49,396
Less: sales of digital archives	- 2,454	- 507
Profit Share from OUP re Journal	**48,035**	**48,890**
Less:printing costs	- 12,000	- 12,000
plates	- 1,080	- 8,280
Editor & CM meeting expenses	- 1,624	- 1,644
Under/over-provision in previous year	7,476	6,858
Surplus on publication of the Journal	**40,807**	**33,824**

5. RELATED PARTY TRANSACTIONS AND TRUSTEES' EXPENSES

No Trustee or Council Member has recieved any renumeration during the current or previous year. Expenses paid by Trustees and Council Members on behalf of the Society have been reimbursed during the current year as follows.

Trustee	Date	£	Reason
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Hollyman	17.03.21	134.40	AGM webinar
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Hollyman	14.12.21	91.90	Zoom licence Forum
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6. MEETING EXPENSES

The following costs have been incurred on meetings for the Society:

		2021 £	2020 £
AGM:	Speakers travel	-	1,240
	General	-	-
	Dinner	-	-
	Mar Biol Ass	-	180
	Zoom	14	-
	Webinar	134	-
Forum:	Travel	-	-
	Reception drinks	-	-
	Zoom	92	149
	Adobe	30	-
	Benugo (General 2019)	-	-
Council:	Travel	-	738
	Zoom (Feb/March)	29	15
		300	**2,306**

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Although grants and awards are given to individuals, in many cases those individuals are affiliated with an institution. Under the SORP, the Society is required to give an analysis of the range of institutions for whom grants and awards are paid:

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	1,255	University of Lincoln (UK)
	1,500	Cambridge University (UK)
	1,500	University of Philippines (Philippines)
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	1,250	University of Malaga (Spain)
	1,500	Jagiellonian University (PL)
	1,500	University of Philadelphia (US)
	-1,500	University of St Andrews (UK) returned from 2020
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	1,043	University of Leeds (UK)
	1,500	Senckenberg Institute (D but UK account)
Total	**13,948**	

In the year the total amount of grants to institutions was £13948.

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In 2021 no funds were transferred to the COIF Investment fund and to the Fixed Interest Fund.
The following investments are held as at 31st December 2021

	Number of units	Price	Market Value	Book Value
		31-Dec-21	31-Dec-21	31-Dec-20
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These investments have been valued at market price (£441,821) in the Balance sheet, with appropriate adjustment (£41,202 - £0 transfers) for the increase in their value (£41,202) in the Statement of Financial activities as an unrealised gain.

9. CASH DEPOSITS

The following accounts are held and the balances in each account are:

	2021	2020
	£	£
COIF Deposit	2,102	2,101
HSBC Bank Current Account	85,894	53,718
Total	**87,996**	**55,819**

10. CURRENT ASSESTS & LIABILITIES

The following debtors are outstanding

	2021	2020
	£	£
Forum Travel awards not used	-	-

The following creditors are outstanding:

	2021	2020
	£	£
Society Journal (provision)	12,000	12,000
Accruals	1,188	1,128
	13,188	**13,128**

11. UNRESTRICTED FUNDS

The following movements have taken place within the Society's four designated funds:

	Revenue	Annual Award	CM Yonge Award	Reseach & other Awards	Total
	£	£	£	£	£
Balance: 1st January 2021	347,560	6,500	9,250	80,000	**443,310**
Interest Earned	1,010	166	234	1,771	**3,181**
Grants	-	-	-	- 13,948	**- 13,948**
Allocated Surplus: 2021	72,309	- 166	- 234	12,177	**84,086**
Balance: 31st December 2021	**420,879**	**6,500**	**9,250**	**80,000**	**516,629**

The Trustees can, by resolution at one of their meetings, re-designate these funds for other purposes.

REGISTERED CHARITY NUMBER: 275980

REPORT OF THE TRUSTEES AND UNAUDITED FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2021 FOR THE MALACOLOGICAL SOCIETY OF LONDON

Staffords
Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
Oakington Road, Girton
CAMBRIDGE
Cambridgeshire
CB3 0QH

THE MALACOLOGICAL SOCIETY OF LONDON

CONTENTS OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2021

THE MALACOLOGICAL SOCIETY OF LONDON

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2021

The trustees present their report with the financial statements of the charity for the year ended 31 December 2021. The trustees have adopted the provisions of the Charities SORP (FRS102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

STRUCTURE, GOVERNANCE AND MANAGEMENT

Governing document

The charity is controlled by its governing document, a deed of trust, and constitutes an unincorporated charity.

The governing document is continually reviewed following its original adoption on 17 May 1978, with the current operative revision of the governing document being that amended on 28 April 2005.

Recruitment and appointment of new trustees

Nominations for Council (the board of related party) from members must be proposed and seconded and in the hands of the Secretary by December 31st. Members at the AGM 2016 proposed and seconded that only the Society's President and Officers (Treasurer, Secretary, Membership Secretary, Awards Secretary) are forming the board of trustees. It shall be the duty of Council to nominate members for election to the offices of President, Treasurer, Secretary, Membership Secretary, Editor of the Journal, Editor of the Bulletin, Archivist, Web Manager, and Awards Secretary, and for the vacancies in the Council caused by annual retirement. Nominations from the members and from Council shall be submitted to the Society with the notice convening the Annual General Meeting which shall be sent to every member of the Society not less than fourteen days before the Meeting.

In the case of a vacancy arising in any office of the Society, or in the Council, other than by way of resignation or retirement in the Annual General Meeting, the Council shall have power to appoint a temporary Council member to that vacancy until the next Annual General Meeting.

Risk management

The trustees have a duty to identify and review the risks to which the charity is exposed and to ensure appropriate controls are in place to provide reasonable assurance against fraud and error.

In particular:

(a) Admission fees and annual subscriptions shall be such sums as may be determined by a Special General Meeting convened under Rule VI(c), or at the Annual General Meeting.

(b) Subscriptions shall be due on the 1st of January in each year; but in the case of a new member, immediately after election. Members elected during the months of November and December, however, shall not be required to pay for the year in which they are elected.

(c) Any member whose current subscription has not been received in full by 31 January shall be reminded of the arrears in subscription and be informed that despatch of the Journal is suspended until the arrears are paid. No member whose subscription is twelve months in arrears shall be entitled to any of the privileges of the Society, and any member whose subscription is two years in arrears shall cease to be a member of the Society, unless the Council decide otherwise.

(d) The Council shall revise and publicise the conditions of the Society's awards and grants from time to time.

(e) For the purpose of legal protection of the property of the Society, all funds, books and other property shall be declared vested in Council as the Society's Trustees.

(f) The Council shall cause to be kept Minutes of Council and Society Meetings and books of account in respect of all receipts, payments, assets and liabilities. Accounts shall be presented to each Annual General Meeting for approval by members and such accounts shall be audited or independently examined as appropriate.

OBJECTIVES AND ACTIVITIES

Objectives and aims

The governing document contains the following in relation to the objective of the charity:

The objects of the Society are to advance education, research and learning for the public benefit in the study of molluscs from both pure and applied aspects. In furtherance of these objects, but not further or otherwise, the Society shall have the following powers:

(a) To promote and co-ordinate meetings and symposia,

(b) To promote and co-ordinate research both pure and applied;

(c) To provide for the worldwide dissemination of the useful results of such research by publication of the Journal of Molluscan Studies;

(d) To award prizes to outstanding students in the field of molluscan biology;

(e) To award research grants to individuals which will advance the study of molluscan biology;

(f) To do all such things as will further the objects of the Society.

Significant activities

In 2021 the Malacological Society of London held a virtual AGM meeting with the online symposium “Molluscs in Extreme Environments”, and the annual Molluscan Forum for Young Scientists was also held virtually. The Society published the members' bulletin "The Malacologist" and in cooperation with Oxford University Press "Journal of Molluscan Studies".

Public benefit

The charity's objects are for the public benefit because increasing public knowledge is required as they form an important part of the global biodiversity and ecosystem stability which can have effects on human health and are a human food source.

ACHIEVEMENT AND PERFORMANCE

Charitable activities

In 2021 the main charitable activities were the funding of seven ECR and three SCR research projects, of which all claimed, additionally to one 2020 ECR claiming their grant late and one 2020 ECR returning their grant (total cost of £13,948) and the support of one student to attend conference, an activity highly impacted by Covid-19 as the Society usually supports around 20 scientists here.

FINANCIAL REVIEW

The finances of the Malacological Society have been pleasing during 20201 with an overall gain of £73,378. This gain is explained by a gain in the Investment fund and lower awards and meeting expenditure.

Our investments had an overall gain of £41,202 (comparing market value at 31 December 2021 with market value at 31 December 2020), with the COIF Investment Fund making a gain of £49015 and the COIF Fixed Interest Fund a loss of £7814. During 2021, no funds were transferred from the current account to savings accounts.

Separately, the profit-share from the publication of the Journal of Molluscan Studies in 2021provided the Society with most of its income contributing £48,035. The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal. In addition, sales of the digital archives provided £2,454 of income.

In 2021, a little more funds were used for research awards, being £13,948 in 2021 compared to £12,262 in 2020, while travel awards significantly dropped pandemic related, but there was reduced spending on Council meetings and Forum travel awards as meetings were held virtually. The Society (MSL) spent less money in 2021 compared to 2020, this was mainly based on less expenses paid for meetings and to OUP for color plates since JMS moved to online only.

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2021

REFERENCE AND ADMINISTRATIVE DETAILS

Registered Charity number
275980

Principal address
c/o British Antarctic Survey
High Cross
Madingley Road
CAMBRIDGE
CB3 0ET

Trustees

J Ablett	President, elected 24th March 2021, ex-Awards Officer
Dr H Wood	Membership Secretary
Dr K Linse	Hon. Treasurer
Dr Debbie Wall Palmer	Hon. Secretary, elected 24th March 2021
Dr Lauren Sumner Rooney	Awards Officer, elected 24th March 2021
Dr J Grahame	Ex- President, term ended 24th March 2021
Dr R Whittle	Ex-Hon. Secretary, term ended 24th March 2021

Independent examiner
Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Approved by order of the board of trustees on ..... and signed on its behalf by:

.....
Jonathan Ablett - Trustee

INDEPENDENT EXAMINER'S REPORT TO THE TRUSTEES OF THE MALACOLOGICAL SOCIETY OF LONDON

I report on the accounts for the year ended 31 December 2021 set out on pages five to ten.

Respective responsibilities of trustees and examiner
The charity's trustees are responsible for the preparation of the accounts. The charity's trustees consider that an audit is not required for this year (under Section 144(2) of the Charities Act 2011 (the 2011 Act)) and that an independent examination is required.

It is my responsibility to:

- examine the accounts under Section 145 of the 2011 Act
- to follow the procedures laid down in the General Directions given by the Charity Commission (under Section 145(5)(b) of the 2011 Act); and
- to state whether particular matters have come to my attention.

Basis of the independent examiner's report
My examination was carried out in accordance with the General Directions given by the Charity Commission. An examination includes a review of the accounting records kept by the charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and seeking explanations from you as trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit, and consequently no opinion is given as to whether the accounts present a 'true and fair view ' and the report is limited to those matters set out in the statements below.

Independent examiner's statement
In connection with my examination, no matter has come to my attention:

(1) which gives me reasonable cause to believe that, in any material respect, the requirements

- to keep accounting records in accordance with Section 130 of the 2011 Act; and
- to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the 2011 Act

have not been met; or

(2) to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Date: .....

The Malacological Society of London

Statement of Financial acitivities (incorporating an income and expenditure account) for the year ended 31st December 2021

Note			TOTAL 2021	TOTAL 2020
	INCOMING RESOURCES			
	Income from Activities of the Charity			
	Members' Subscriptions: Current Year		2,205	1,670
	Collection of Subscription Arrears		-	-
4	OUP: Income from Journal Publication		48,035	48,890
2	Income from sale of Digital Archive		2,454	507
	Sundry Income		105	66
	Donations		-	-
	Income from Investments			
3	Interest	CCLA	0	6
3	Dividends		3,181	3,706
	TOTAL INCOMING RESOURCES		**55,980**	**54,844**
	RESOURCES USED			
	Awards			
	Annual Award		-	-
	WCM Award		-	-
7	Research Awards (Early career & Senior)		13,948	12,262
	EuroMal 2020 award		-	-
			-	-
7	Travel Bursaries for conferences		300	1,050
5,6	Travel awards: AGM		-	1,240
5,6	Travel awards: Forum		-	-
			14,248	**14,552**
	Directly Relating to Work of Charity			
4	Journal expenses		4,524	4,637
4	Journal colour plates		1,080	8,280
4	Journal editor expenses, incl meetings		1,624	1,644
5	Malacologist Expenses		286	41
6	Meeting Expenses		300	358
	Independent examiners expenses		1,188	1,128
5,6	Council Meeting travel expenses		-	738
	Web sites		-	-
5	Postage, Printing & Stationary		446	-
	Charges for cc subscription collection		36	18
	Bank charges		132	222
	Sundries		-	4
	Total		**23,863**	**31,621**
	NET INCOME		**32,117**	**23,223**
8	GAIN ON REVALUATION OF FIXED ASSETS		41,202	28,997
	NET MOVEMENT IN FUNDS		73,319	52,220
	TOTAL FUNDS BROUGHT FORWARD		443,310	391,090
	TOTAL FUNDS CARRIED FORWARD		**516,629**	**443,310**

CONTINUING OPERATIONS

All income and expenditure has arisen from continuing activities.

The Malacological Society of London

Balance Sheet at 31 December 2021

Note		2021	2020
		£	£
	FIXED ASSETS	**441,821**	**400,619**
8	Tangible Assets		
	CURRENT ASSESTS		
11	Debtor	-	-
9	Cash at Banks	87,996	55,819
10	CREDITORS: (Amounts falling due within one year)	- **13,188**	- 13,128
	NET CURRENT ASSETS	**74,808**	**42,691**
	TOTAL NET ASSETS	**516,629**	**443,310**
	FUNDS		
	Unrestricted (Designated):		
11	Annual Award Fund	6,500	6,500
11	CM Yonge Award Fund	9,250	9,250
11	Centenary Research Award Fund	80,000	80,000
		95,750	95,750
11	General reserve Fund	420,879	347,560
	TOTAL FUNDS	**516,629**	**443,310**

Katrin Linse
Honorary Treasurer & Trustee

Dated

Jonathan Ablett
President & Trustee

Dated

The Malacological Society of London

Notes to the Financial Statements for the year ended 31st December 2021

1. ACCOUNTING POLICIES

Basis of Preparing the Financial Statements

The financial statements have been prepared in accordance with the Charities SORP (FRS 102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

- The SORP normally requires a columnar fomat, in this entities case the trustees' view is this is not appropriate as there are neither restricted funds nor endowment funds and so all of the activity in the year would fall within the unrestricted fund column.

Accounting Convention

The financial statements have been preprared under the historical cost convention, except for those items described immediately below.

- The historic cost basis of accounting is used except for investments, which have been included at their market value where readily available at the yearend date.

Going concern

The Trustees consider that there are no material uncertainties about the charity's ability to continue as a going concern.

Reconciliation with previously Generally Accepted Accounting Practice

In preparing the accounts, the trustees have considered whether in applying the accounting policies required by FRS102 and the Charities SORP FRS 102 the reinstatement of comparative items was required. In the case of this charity, no changes were made.

Fund accounting

- The Society funds, including funds available for awards, are not subject to any restrictions regarding their use, and are available to be used for the general purposes of the Charity. Consequently they are classified as 'Designated Funds'.

Taxation

- The charity is exempt from tax on its charitable activities.

Significant judgements

Apart from those judgements involving estimations, the management has not made any judgements in the process of applying the entity's accounting policies that have significant effect on the amounts recognised in the accounts. There are no key assumptions concerning the future or other key sources or estimation uncertainty at the reporting date that have significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next reporting period.

Financial reporting standard 102 - reduced disclosure exemption

The charity has taken advantage of the following disclosure exemption in preparing these financial statements, as permitted by FRS 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland':

- the requirements of Section 7 Statement of Cash Flows

Resources Expended

Expenditure is accounted for on an accruals basis and has been classified under headings that aggregate all cost related to the category. Where costs cannot be directly attributed to particular headings they have been allocated to activities on a basis consistent with the use of resources.

Incoming Resources
All income is recognised in the Statement of Financial Activities once the charity has entitlement to the funds, it is probable that the income will be received and the amount can be measured reliably.

Foreign currencies
- Asessts and liabilities in foreign currencies are translated into sterling at the rates of exchange ruling at the balance sheet date. Transactions in foreign currencies are tranlated into sterling at the rates of exchange ruling at the date of transaction. Exchange differences are taken into account in arriving at the operating result.

Incoming Resources and Resources used
· Subscriptions for annual membership are treated as follows:

Pre-paid in prior year	Liabilities
Paid in current year	Incoming Resource: subscriptions
Unpaid at 31st December	Not included in accounts. No debtor
Subsequently recieved	Incoming Resource: collection of subscriptions in arrears

· The costs of the Society Journal and supplements are written off in the year of initial distribution.
· The Profit Share from Oxford Journals is included in the year of receipt and not accrued.
The amount of Profit Share cannot be determined accurately by OUP until after the Society's AGM.

2. SALE OF THE DIGITAL ARCHIVE BY OUP
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	1,500	University of Philadelphia (US)
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Grants	-	-	-	- 13,948	**- 13,948**
Allocated Surplus: 2021	72,309	- 166	- 234	12,177	**84,086**
Balance: 31st December 2021	**420,879**	**6,500**	**9,250**	**80,000**	**516,629**

The Trustees can, by resolution at one of their meetings, re-designate these funds for other purposes.

THE MALACOLOGICAL SOCIETY OF LONDON

England & Wales - Charity number 275980

Accounts

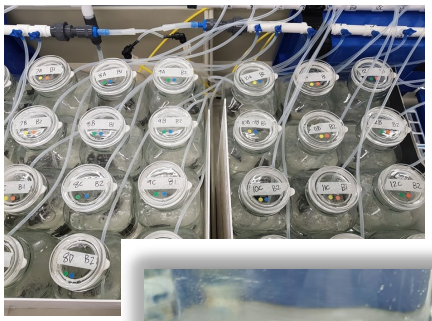
ISSN 1759-1406

The Malacologist

The Bulletin of The Malacological Society of London

NUMBER 77 AUGUST 2021

Contents



Despite covid-19, malacologists make their best endeavours. The mages above are from the Early Career Research Grant report of Alice Wilson McNeal on impacts of ocean acidification and pharmaceutical contamination on *Mytilus edulis* (see report on page 21).

EDITORIAL

It is still the time of covid. As I write, English case numbers stand at a mean of 31698/day and deaths at a mean of 100/day over the last week. That is *circa*50000 extra deaths per year (compare this with approximately 3000 mortalities when the Twin Towers were felled in New York). While the hospital situation seems to have improved since the last issue of *The Malacologist*, many young and some old people are developing long covid, while the country struggles to keep on a 'normal', even keel, including for those pursuing the objectives of malacology, such as running meetings. Despite the difficulties, the President John Grahame hosted an excellent virtual meeting of the **AGM** and a **virtual conference on *Molluscs in Extreme Environments,*** held on the same day. The abstracts from the conference are presented on pages 34-43 this issue.

This issue also presents an invited article on the biology of the molluscan shell. This was my personal indulgence, since I had encountered the author, Alessia Carini, when she was a presenter in a quickfire session at the 2020 Forum. Some fifty years ago, I had researched the biochemistry of freshwater molluscan shells, so I was particularly intrigued to see how things had developed in the interim.

It is encouraging to the Society's efforts to be able to present several **Early Career Research Grant Reports,** including an account of Lukas Ostermair's work on *Molecular analyses of solenogaster midgut contents to determine food sources* , the report of Alice Wilson-McNeal on the *Impacts of ocean acidification and pharmaceutical contamination on Mytilus edulis,* and the report of Samuel Abalde on *Using shotgun sequencing for disentangling a taxonomic jumble: the case study of the skeneimorphs.*

There are two **book reviews**—firstly of the book *Molluscan genomics: broad insights and future directions for a neglected phylum by Angus Davison and Maurine Neiman* which summarises a recent Royal Society conference. Secondly there is a review of Peter Godfrey-Smith's book entitled *Other minds—the octopus and evolution of intelligent life.* The review also references a recent BBC documentary on octopuses.

Unfortunately, *The Malacologist* also carries **obituaries.** Here there are tributes to Brian Morton, Arie W. Janssen and Jack Burch.

Finally, this issue covers the formalities of the AGM, together with its associated virtual conference *Molluscs in Extreme Environments.* So, this turns out to be rather a large issue. Here's hoping that all our readers stay covid free and above all, safe.

Emeritus Prof. Georges Dussart
Canterbury Christ Church University
Canterbury,
Kent CT1 3JZ
georges.dussart@canterbury.ac.uk

TAXONOMIC/NOMENCLATURAL DISCLAIMER
This publication is not deemed to be valid for taxonomic/nomenclatural purposes [see Article 8b in the International Code of Zoological Nomenclature 3rd Edition (1985), edited by W.D. Ride *et al.*].

NOTICES

J Frances Allen Institute of Malacology Student Research Award

The Board of Directors of the Institute of Malacology, publisher of the academic journal *Malacologia*, is pleased to announce the recipients of the 2021 J Frances Allen Institute of Malacology Student Research Award, a newly created award to support field or laboratory research on molluscs conducted by a student enrolled in a degree-granting program. We received 17 outstanding proposals from undergraduate and graduate students representing nine countries. The proposals were reviewed by a committee of the IM Board and were evaluated on the quality, feasibility, and potential significance of the proposed research.

The first recipients of this award are:

- Nicholas Gladstone, Auburn University, USA: Re-evaluation of the phenotypic plasticity hypothesis in a freshwater gastropod complex using phylogenomics, population genomics, and morphometrics (Pleuroceridae: *Lithasia*)
- Noelia Sánchez, National University of La Plata, Argentina: Conoidean gastropods from unexplored Argentine deep-waters: the family Drilliidae
- Taro Yoshimura, The University of Tokyo, Japan: Sulfur detoxification by biomineralization in the hadal chemosynthetic bivalve *Axinulus hadalis* (Thyasiridae)

Please join me in congratulating the successful applicants. We wish them every success in completing their proposed research!

Ellen Strong
President
Institute of Malacology

The Octopus in My House

This is the title of a BBC programme about the relationship between a Professor and diver David Scheel and a wild octopus.

ON BBC iplayer—BBC Two - Natural World, 2019-2020, The Octopus in My House

See page 26 for a review of this programme.

Squid in Space

Images, selected by the Bailey-Matthews National Shell Museum's Curator and Science Director Dr. José H. Leal convey a range of the singular beauty in the world of molluscs. For more information visit the website at www.shellmuseum.org/in-focus

The tiny squid illustrated below were due to head into space on June 3, 2021, along with many other scientific experiments aboard SpaceX's 22nd cargo resupply mission to the International Space Station. The squid were part of the UMAMI study which examines the effects of spaceflight on interactions between beneficial microbes and their animal hosts. UMAMI stands for Understanding of Microgravity on Animal-Microbe Interactions. Microbes play a significant role in the normal development of animal tissues and in maintaining human health. The Understanding of Microgravity on Animal-Microbe Interactions (UMAMI) study uses bobtail squid and bacteria to examine the effects of spaceflight on interactions between beneficial microbes and their animal hosts. This type of relationship is known as symbiosis. Beneficial microbes play a significant role in the normal development of animal tissues and in maintaining human health, but gravity's role in shaping these interactions is not well understood. This experiment could support the development of measures to preserve astronaut health and identify ways to protect and enhance these relationships for applications on Earth. This investigation helps determine whether spaceflight alters the mutually beneficial relationship, which could support development of protective measures and mitigation to preserve astronaut health on long-duration space missions. The work also could also lead to a better understanding of the complex interactions between animals and beneficial microbes, including new and novel pathways that microbes might use to communicate with animal tissues. Such knowledge could help identify ways to protect and enhance these relationships for better human health and well-being on Earth as well.

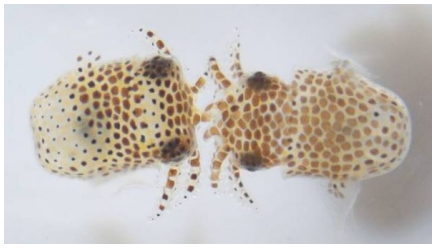


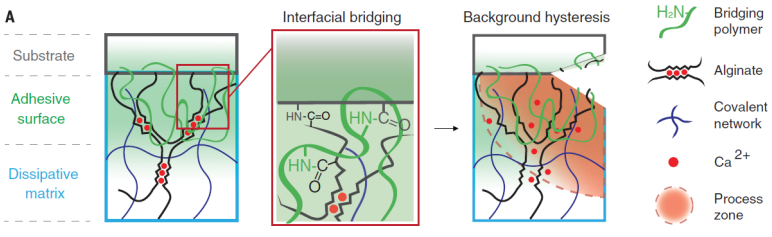
Image Credit: Courtesy of Jamie S. Foster

Yvette Smith May 26, 2021

Using slug slime to engineer adhesives for diverse wet surfaces

Abstract of the paper - Adhesion to wet and dynamic surfaces, including biological tissues, is important in many fields but has proved to be extremely challenging. Existing adhesives are cytotoxic, adhere weakly to tissues, or cannot be used in wet environments. We report a bioinspired design for adhesives consisting of two layers: an adhesive surface and a dissipative matrix. The former adheres to the substratum by electrostatic interactions, covalent bonds, and physical interpenetration. The latter amplifies energy dissipation through hysteresis. The two layers synergistically lead to higher adhesion energies on wet surfaces as compared with those of existing adhesives. Adhesion occurs within minutes, independent of bloodexposure and compatible with *in vivo* dynamic movements. This family of adhesives may be useful in many areas of application, including tissue adhesives, wound dressings, and tissue repair…..

From within the text - The design is inspired by a defensive mucus secreted by slugs (*Arion subfuscus*) that strongly adheres to wet surfaces. This slug adhesive consists of a tough matrix with interpenetrating positively charged proteins. Our tough adhesives are made up two layers: (i) an adhesive surface containing an interpenetrating positively charged polymer and (ii) a dissipative matrix (Figure). The adhesive surface can bond to the substratum through electrostatic interactions, covalent bonds, and physical interpenetration, whereas the matrix dissipates energy through hysteresis under deformation.



Reference

Li A., Celiz A.D., Yang J., Yang Q., Wamala I., Whyte W., Seo, B., Vasilyev N.V., Vlassak J.J., Suo Z, & Mooney D.J. 2017. Tough adhesives for diverse wet surfaces. *Science,* **357**: 378–381.

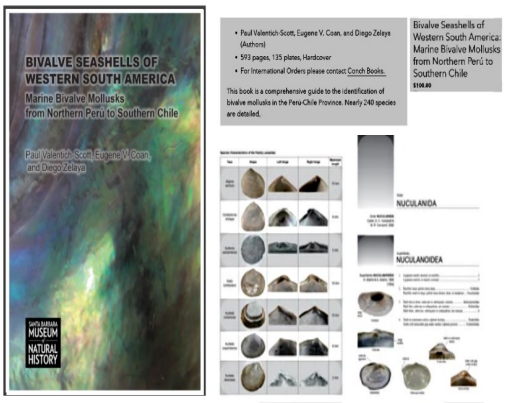
OctoCam is LIVE!

On April 30th, the Bailey-Matthews Shell Museum unveiled its live stream of OctoCam - an underwater camera that gives visitors a unique view into the nocturnal life of its Giant Pacific Octopus. To see the octopus live, plus highlight footage of its very active moments follow:-
www.shellmuseum.org/octocam
Dr. José H. Leal, Science Director and Curator
Bailey-Matthews Shell Museum
3075 Sanibel Captiva Rd. Sanibel, FL 33957, USA

Companions for the evening

Patricia Highsmith once went to a London cocktail party with a "gigantic handbag" that "contained a head of lettuce and a hundred snails" which she said were her companions for the evening.

New book on South American bivalve molluscs https://bit.ly/2HIPPj2



Gene Coan and **Paul Valentich-Scott** have completed the eastern Pacific marine bivalve series (https://bit.ly/2HIPPj2) and are making the combined bibliography for the three books available online. This includes over 7,600 references cited in their mongraphs. In addition, John Taylor and Emily Glover have shared the bibliography from their recent book on the Bivalve Family Lucinidae (https://bit.ly/3b1iSKg). This has added an additional 500 references to the bibliographies, including those on vent and seagrass communities. The database is accessible through an open-source freeware called Zotero (https://www.zotero.org). A free Zotero account should be set up if you wish to access this database. If you are interested in accessing this database, send your email address pvscott@sbnature2.org. You will need to send the email you used to set up a zotero account.

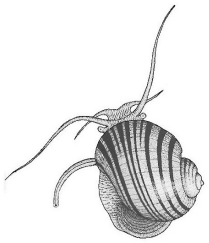
Paul Valentich-Scott, Curator Emeritus of Malacology
Santa Barbara Museum of Natural History
2559 Puesta del Sol, Santa Barbara, CA 93105
www.sbnature.org

Late evening work

The slugs and snails in my garden (particularly *Arion ater* and *Cornu aspersaa*) re bullies, homing in on weaker plants and stripping an individual plant of its leaves in a single night. Starting in March, and for several weeks, I go into the garden before bedtime with a torch, a jam jar and a plumber's glove, collecting slugs and snails from my seedlings. I put them in the freezer overnight to painlessly kill them, then bury the corpses deep in the compost heap. The first several nights, I get a jam jar full each night. The numbers decline as I make inroads into the population but I never get them all. Sometimes it seems there is the molluscan equivalent of a small sheep feeding at night on my flowers and veg.

GBJD

The Malacological Society of London's *Molluscan Forum*



Because of Covid-19, the Molluscan Forum will take place in a different format this year. We still plan to hold the event and will do so via an online platform (probably Zoom) on Thursday 18th November 2021.

As in previous years, for those wishing to offer a presentation, please fill out the attached registration form. For those just wanting to attend, please let me know so I can keep track of attendees. The **deadline for registrations and talk applications is October 1st 2021.** Presenters will be informed of successful applications soon after**.**

Registration is **free!**

In lieu of posters, we will instead have 5 minute (3 slide maximum) **Quickfire PowerPoint** presentations,

We hope these changes will still allow all those who wish to attend and present the chance to do so, even if we can't offer the customary wine reception!

For further details and an application form, see page 51.

The contact is Dr Phil Hollyman
British Antarctic Survey, Cambridge CB3 0ET
Email: phyman@bas.ac.uk

A climate-warming relevant snail joke from Tim Pearce

https://www.facebook.com/watch/?v=796957347660223

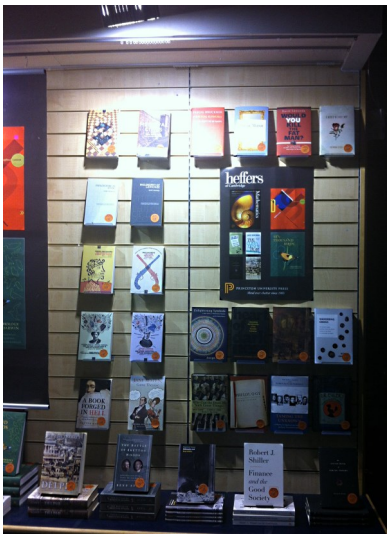
Molluscan genomics: broad insights and future directions for a neglected phylum

Royal Society Publishing has recently published a special issue of Philosophical Transactions B - *Theo Murphy meeting Molluscan genomics: broad insights and future directions for a neglected phylum* organized and edited by Dr Angus Davison and Dr Maurine Neiman. Articles can be accessed directly at www.bit.ly/PTB1825. If your institution does not give access to the full text, corresponding authors will probably be happy to send a pdf, or else contact Maurine or Angus. A print version is also available at the special price of £35.00 per issue, by contacting Debbie.vaughan@royalsociety.org

Dr Angus Davison, Reader and Associate Professor in Evolutionary Genetics
School of Life Sciences, University Park
University of Nottingham
Nottingham, NG7 2RD
angus.davison@nottingham.ac.uk

(This Royal Society special issue is reviewed on Page 25 of this issue of *The Malacologist*)

Spot the mollusc



Bailey-Matthews National Shell Museum

The Chiton and the Whelk

Museum's Senior Aquarist Carly Hulse took this great photo, at the Cold-water Touch Pool, of a Lined Chitons (*Tonicella lineata*) riding a Kellet's Whelk (*Kelletia kelletii*). The chiton needs hard substrata to live and feed on, and the whelk's shell serves that purpose.

Lined Chiton riding a Kellet's Whelk. Photo by Carly Hulse.

The whelk's right tentacle is touching the bottom of the aquarium. All molluscs in the Cold-water Touch Pool were obtained from the West Coast of the US, where the water temperature is in average at least several degrees cooler than the water temperature in Southwest Florida.
(with the permission of José H. Leal, Bailey Matthews National Shell Museum)

Mollusc conservation—Tentacle

The latest issue - number 29 - of Tentacle (the newsletter of the IUCN - Species Survival Commission - Mollusc Specialist Group) is now available on the web.
http://www.hawaii.edu/cowielab/issues.html

Tentacle is an on-line only publication, though of course you may print it for yourself if you wish.

Malacological cosmetic treatment as portrayed in the new TV series 'Murder in Mallorca'

Mollusc themed dinner plate from the Charente region of France

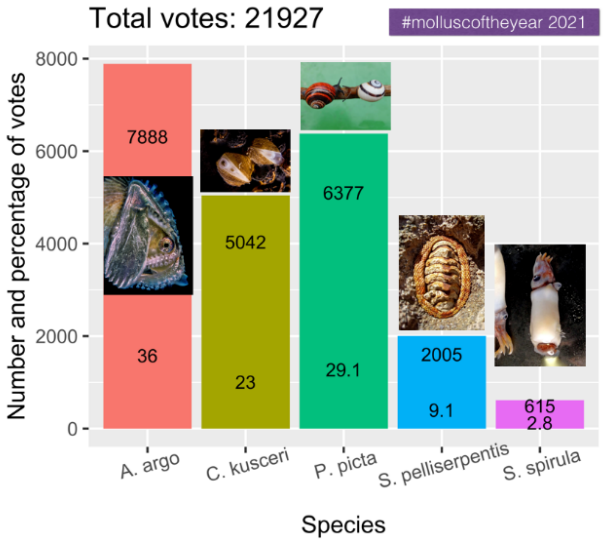
Article on the co-existence of *Crassostrea* and *Mytilus*

Ecological impacts caused by invasive alien species can be severe but may vary depending upon environmental conditions. Many European populations of the native mussel, *Mytilus edulis,* have been invaded by the Pacific oyster, *Crassostrea (Magallana) gigas*. Although widespread invasions have occurred, interactions between *M. edulis* and *C. gigas* have largely been investigated with regards to competition for space and food as well as effects on species assemblages. Experimental investigation of competitive interactions on physiological responses of the two species requires further exploration. To this end, we used a 12-month field manipulation experiment to examine growth rates, mortality and condition indices of the two species occurring in monospecific and heterospecific groups. Growth rates and mortality of both species were similar in monospecific and heterospecific groups, whereas condition indices were significantly reduced for both species in heterospecific groups. Growth rates and condition indices also differed amongst experimental sites, potentially due to differing water motion. Shell weight-length relationships did not explain the observed differences in condition for either species. Coexistence between the two species may occur but could be detrimental for both species. A preliminary viewpoint that water motion can mediate competitive interactions between these species is also provided.

P. Joyce, D. Smyth, J. Dick & L. Kregting (2020)
Coexistence of the native mussel, *Mytilus edulis*, and the invasive Pacific oyster, *Crassostrea (Magallana) gigas*, does not affect their growth or mortality, but reduces condition of both species
Hydrobiologia https://doi.org/10.1007/s10750-021-04558-1(0123456789().,-volV)(01234567

Mollusc of the Year

This award was organised by the Senckenberg Research Institute, together with the LOEWE Translational Biodiversity Genomics centre, and Unitas Malacologica. There were over 120 nominations for any molluscan species from any marine, terrestrial, freshwater zone or from any country. The first, ever, international Mollusc of the Year award went to *Argonauta argo.* More than 21,000 votes were cast by the public, with *Argonauta* capturing 36% of the vote, followed closely by *Polymita pita,* and *Congeria kusceri* (see image below). Specimens of *Argonauta argo* from the nominating group, at Stazione Zoologica Anton Dohrn, Naples, Italy, have now arrived at the Senckenberg LOEWE Translational Biodiversity Genomics centre, where a team will sequence the complete genome during 2021. The organisers send a huge' thankyou' to all who nominated species, and all who voted! It is hoped to repeat the award next year. There is more about the competition here: https://tbg.senckenberg.de/mollusc/
Julia Sigwart



Decapitated sea slug grows a new body

Video at:-instagram.com/p/CMNQ_t0qOx7/?igshid=mn8no78cwweoscitechdaily.com

Sayaka Mitoh & Yoichi Yusa, 2021, Extreme autotomy and regeneration of the whole body in photosynthetic sea slugs. *Current Biology*, **31**: 5R233–R234, **DOI: 10.1016/j.cub.2021.01.014**

Cuttlefish exert self-control

The ability to exert self-control varies within and across taxa. Some species can exert self-control for several seconds whereas others, such as large-brained vertebrates, can tolerate delays of up to several minutes. Advanced self-control has been linked to better performance in cognitive tasks and has been hypothesized to evolve in response to specific socio-ecological pressures. These pressures are difficult to uncouple because previously studied species face similar socio-ecological challenges. Here, self-control and learning performance is investigated in the cuttlefish, an invertebrate that is thought to have evolved under partially different pressures to previously studied vertebrates. To test self-control, cuttlefish were presented with a delay maintenance task, which measures an individual's ability to forgo immediate gratification and sustain a delay for a better but delayed reward. Cuttlefish maintained delay durations for up to 50–130 s. To test learning performance, a reversal-learning task was used, whereby cuttlefish were required to learn to associate the reward with one of two stimuli and then subsequently learn to associate the reward with the alternative stimulus. Cuttlefish that delayed gratification for longer had better learning performance. These results demonstrate that cuttlefish can tolerate delays to obtain food of higher quality comparable to that of some large-brained vertebrates.

Schnell A.K., Boeckle M., Rivera, M., Clayton N.S. & Hanlon R.T. 2021. Cuttlefish exert self-control in a delay of gratification task. *Proc. R. Soc. B* **288**: 20203161. https://doi.org/10.1098/rspb.2020.3161

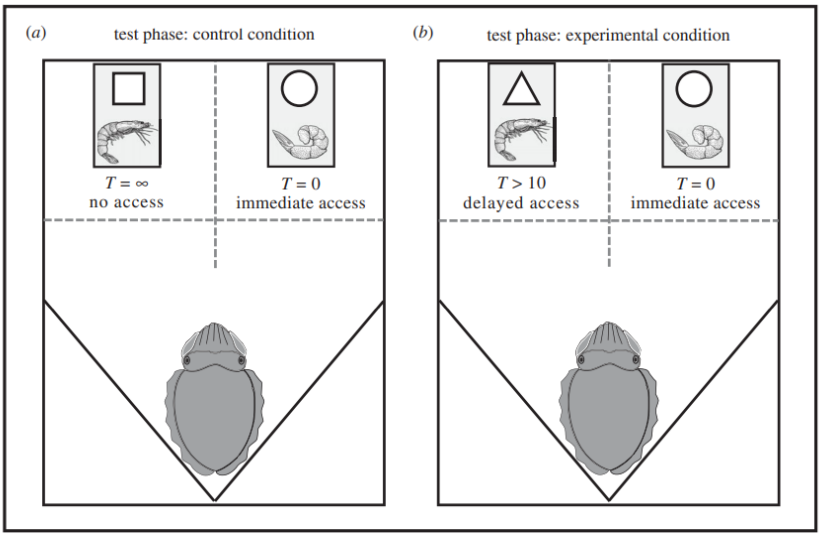


Figure 1. Schematic of the test conditions in the delay maintenance task: (*a*) control condition and (*b*) experimental condition. The different shaped visual symbols represent the time delays that were associated with each chamber. *T* represents the delay in seconds: $T = \infty$ represents a perpetual delay (a second film of clear Perspex obstructed access to the prey); $T = 0$ represents immediate access; and $T > 10$ represents delays ranging from 10–130 s. The immediate-release chamber ($T = 0$) was always baited with the less preferred prey whereas the delayed chambers ($T = \infty$ and $T > 10$) were always baited with the preferred prey. The dotted lines represent the decision point, where the cuttlefish makes a choice between the prey items on offer.

Slug (*Lehmannia nyctellia*) slides down a mucus thread like a spider on silk

Published:03 March 2021https://doi.org/10.1098/rspb.2020.3161

https://www.iflscience.com/plants-and-animal /World-First Sighting Of Slug Sliding Down Mucus Thread Like A Spider On Silk | IFLScience

A striped field slug (Lehmannia nyctelia) descending a mucus thread
ohn Gould & Jose W Valdez

Call for Applications: 2022 Conservation Leadership Programme (CLP) Team Awards

Funding opportunity for young scientists working in species conservation

The funding comes with a training opportunity for one team member to take part in a highly regarded course, usually held in Cambridge UK, although recently it has been held online.

Previous grants have tended to be awarded to bird, mammal and plant projects, so the competition is high. However, with a good project and clear outcomes, there is an chance for young invertebrate conservationists to make an application for a place. Projects working to resolve understanding of the status of *Data deficient species* can be equally valid as conservation assessments and recovery plans for threatened species. Freshwater spring snails, Cave invertebrates or species that exist in world heritage sites might be good candidates for projects.

https://www.conservationleadershipprogramme.org/our-projects/latest-projects-2021/

Successful candidates have the opportunity for follow-up funding for projects.

The Conservation Leadership Programme (CLP) is now accepting applications for our 2022 Team Awards. Future Conservationist Awards are worth up to $15,000 each and support projects in low- and middle-income countries and some high-income islands in the Caribbean and Pacific. Funding enables early-career conservationists to conduct scientific research, encourage and promote pro-conservation attitudes to better conserve and manage the natural world. Each project must have at least three members and all team members must have less than five years of paid conservation experience. Projects can last 3-12 months and must focus on a threatened species. In addition to project funding, CLP will invite one member of each award-winning team to their international training course where they will gain a range of conservation management and leadership skills as well as build their professional network.

The application deadline is 10 October, 2021.

For more information, including the eligibility criteria and detailed application guidelines, please visit our website. Applications must be submitted via the online platform (potential applicants will need to register to be able to complete the application form). Contact clp@birdlife.org with any questions.

Stuart.Paterson@fauna-flora.org>

16th Deep Sea Biology Symposium, Brest, France 12-17 September 2021

Welcome to the 16th edition of the Deep Sea Biology Symposium!

We are very excited about the opportunity to host the 16th Deep-Sea Biology Symposium in Brest, France between 12 and 17 of September 2021!

Brest's history has always been linked to the sea and the oceans. Nowadays, Brest has a leading position in European deep-sea science, technology and industry.

Ifremer has a long experience in deep-sea research and technology with a dedicated deep-sea department (Department of Physical Resources and Deep-Sea Ecosystems-REM), mainly investigating the deep-sea seafloor and the sub-seafloor, biodiversity and the dynamics of deep-sea ecosystems, and the interaction between the biosphere and the geosphere on scales ranging from bacteria to the glacial cycles.

The meeting includes special sessions on the impacts of deep sea mining and polymetallic mining.
Programme https://wwz.ifremer.fr/16dsbs/Program
Conference information https://wwz.ifremer.fr/16dsbs/Conference-Information

New book—Bivalve seashells of Western South America

- Paul Valentich-Scott, Eugene V. Coan, and Diego Zelaya (Authors)
- 593 pages, 135 plates, Hardcover
- For International Orders please contact Conch Books.

This book is a comprehensive guide to the identification of bivalve mollusks in the Perú-Chile Province. Nearly 240 species are detailed,

Bivalve Seashells of Western South America: Marine Bivalve Mollusks from Northern Perú to Southern Chile
$100.00

Carnivore Dilemma

Most bivalve molluscs are filter-feeders, straining water to get their food, usually microscopic plants. Exceptions to this include marine clams that prey on small creatures, such as crustaceans. Some of these clams, the septibranchs, use a flexible, muscular "wall", or septum, as a diaphragm pump that allows the animal to quickly and decisively suck prey in. The inch-long Specter Clam, *Dilemma spectralis* Leal, 2008 (below), a deep-sea dweller found off Vanuatu in the SW Pacific, is one of them. It is possible, given that *Dilemma* clams live permanently attached to rocks, that Specter Clams may use some form of chemical attraction to lure nearby prey.

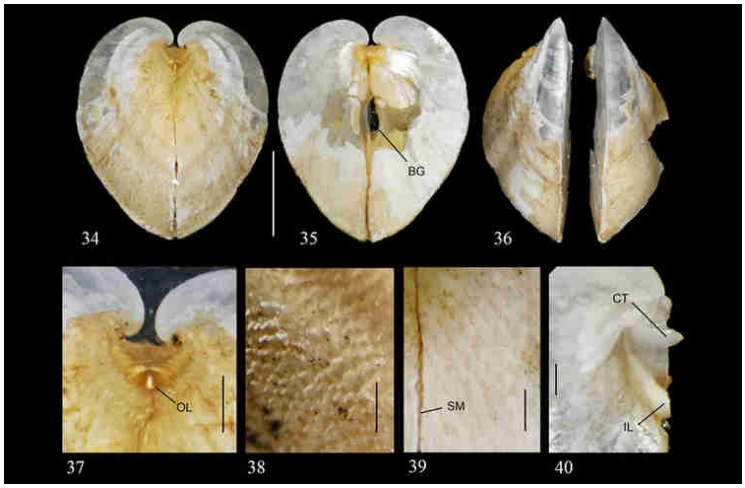


Fig. 1 ***Dilemma spectralis*****, different views of an unusual shell. From the original species description.**

Fig. 2 shows from left, a whole preserved clam, the clam with shell removed, and drawing (by Kimberly Nealon) showing the stomach with its crustacean food, in this particular case an isopod crustacean. The drawing also shows the *incurrent siphon*, or opening through which prey is ingested.

Fig. 2

Jose H Leal (2008) A remarkable new genus of carnivorous, sessile bivalves (Mollusca: Anomalodesmata: Poromyidae) with descriptions of two new species. *Zootaxa* **1764**:1-18

Invited article

Marine shells: the beauty and the resilience

Alessia Carini

The Swire Institute of Marine Science and School of Biological Sciences,
The University of Hong Kong,
Pokfulam Road, Hong Kong SAR
Email: acarini@hku.uk

People strolling along the beach have been collecting shells since prehistoric times and treasured them as beautiful, sometimes spiritual, marine tokens (Scales, 2015). Many public beachgoers who stumble upon empty shells do not realize that these are the washed-up legacy of living organisms. This could be because marine shells can resemble perfect pieces of elegant, stony, small (and occasionally large) rocks. They are indeed composed of a mineral analogous to limestone, yet, contrastingly, they can be shaped in extraordinary forms, and, as you know if you have ever cut your foot on the beach, of puncturing sharpness and strength. Marine shells recovered on beaches are often either the coiled exoskeletons of gastropods or the disjointed half of bivalve shells, and here I will mostly draw examples from the latter group.

Molluscs are the second species richest phylum in the world after the Arthropods and the class *Bivalvia* accounts for an estimated 10,000-20,000 extant species (Gonzalez *et al*., 2015). They are characterized by two tightly fastened valves, sometimes but not exclusively, symmetrical. Since their appearance in the Cambrian, around half a billion years ago, they have spread to an incredible number of different habitats, from the tropics to the arctic, from lakes to hydrothermal vents, and survived several catastrophic events in our Earth's history such as the Palaeocene-Eocene Thermal Maximum (PETM). The PETM was characterized by warming, acidification and hypoxia that lead to severe extinctions and changes in global ecosystems. Little lasting impact was sustained by molluscs however (Ivany *et al*., 2018). Simply, these unpretentious invertebrates are resourceful. The evolutionary success of the bivalves is the manifestation of small modifications to an already simple animal body plan (Plazzi *et al.,* 2011) and, importantly, the reason bivalves are traditionally thought to have been so successful is the secretion of the external shell (Clark *et al*., 2020).

The bivalve shell is a composite biomineral, incorporating mineral and organic components, and molluscs produce the highest diversity of biominerals of any animal group (Lowenstam & Weiner, 1989). The mineral of choice by the vast majority of bivalves is calcium carbonate ($CaCO_3$), which, in its abiotic form is typically unimpressive, not only in shape but also in mechanical properties. However, when moulded into a shell by a mollusc, it takes beautiful, complex, and mechanically superior forms. This is a good example of structural potential once biology and evolution join forces to create forms able to persevere for millions of years.

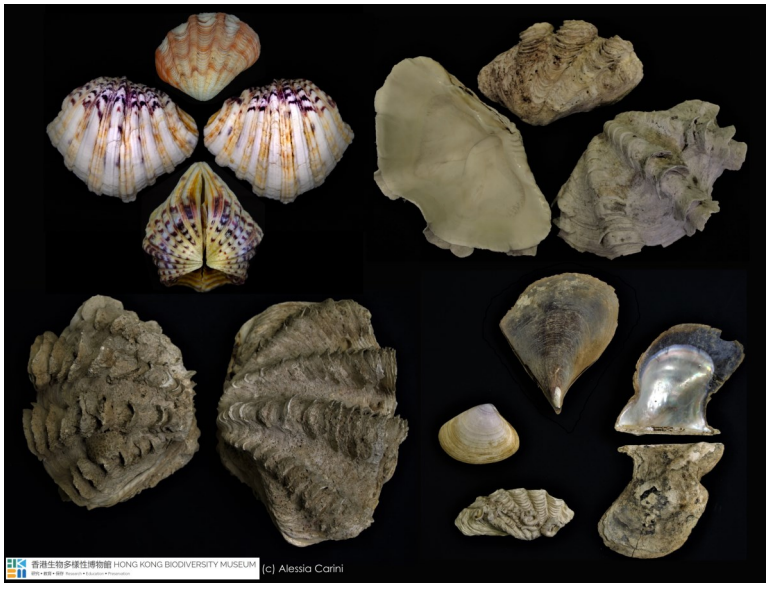


Fig 1. Some of the bivalve shells in the collection in the Hong Kong Biodiversity Museum. Shells are not to scale.

Evidence suggests that the molluscan shell evolved from an ancestor with a chitinous scaffold (Murdoc, 2020). Since eukaryotic cells have the inherent capacity to bind calcium ions and control their internal carbonate chemistry, accumulating ions for calcification simply exploited some ancient cellular features (Knoll, 2003). However, biomineralization is energetically costly, hence, there are metabolic constraints on organisms that limit the evolutionary potential for skeletal components (Knoll, 2003; Schoeppler *et al.,* 2019).

Even so, for biomineralization to be so widespread, the benefits of having a shell must offset the metabolic costs, yet the energy spent to secrete a shell must be flexible as a response to the requirements by the external environment (Knoll, 2003). Ultimately, the evolutionary and metabolic constraints are the drivers for the diversity of structures that we see today. Intuitively, the bivalve shell functions as armour and structural support for the vulnerable, and, regrettably for the bivalve, tasty soft body for a predator. Nonetheless, bivalve shells can have several different functions other than structural ones.

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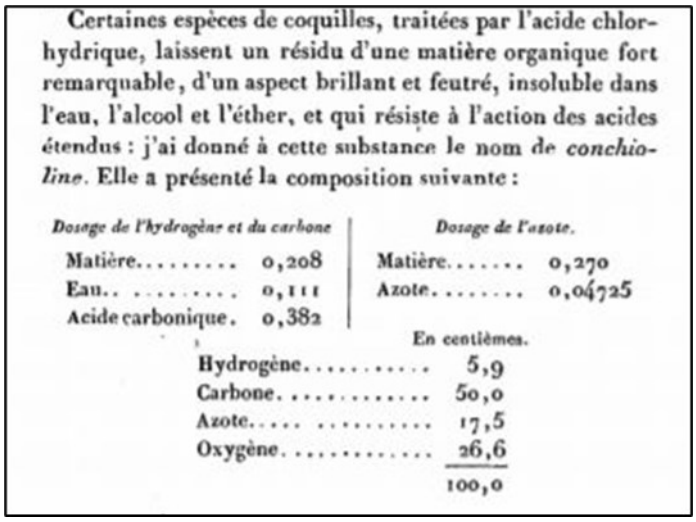
For example, several bivalve species live in intertidal regions where they are exposed to air or sediments for extended periods. In these scenarios, the shell prevents dehydration by locking tightly and retaining water. In some cases, shells can act as reservoirs and release ions to neutralize internal pH which quickly decreases due to excessive production of metabolic CO_2 (Lowenstam 1981).



Certaines espèces de coquilles, traitées par l'acide chlorhydrique, laissent un résidu d'une matière organique fort remarquable, d'un aspect brillant et feutré, insoluble dans l'eau, l'alcool et l'éther, et qui résiste à l'action des acides étendus : j'ai donné à cette substance le nom de *conchioline*. Elle a présenté la composition suivante :

Dosage de l'hydrogène et du carbone

Matière.....	0,208
Eau..	0,111
Acide carbonique.	0,382

Dosage de l'azote.

Matière.....	0,270
Azote.....	0,04725

En centièmes.

Hydrogène.....	5,9
Carbone.....	50,0
Azote.....	17,5
Oxygène.....	26,6
	100,0

Fig. 2. Extract from Fremy, E. 1855. Roughly translated, Fremy reports that certain shells, when treated with acid, release a remarkable organic matter, of a shiny and felted appearance, insoluble in water, alcohol, and ether, capable of withstanding the extended action of acids. He names it conchiolin and then describes its organic composition This was probably the first ever description of conchiolin.

The basics of shell formations are that calcium, carbonate and/or bicarbonate ions are extracted from seawater and concentrated in a confined space by the bivalve at a much higher level than the surrounding seawater. Isolation of this medium from the external seawater is necessary to facilitate and promote calcification. $CaCO_3$ is then deposited together with an organic fraction called the shell organic matrix. This matrix is extracellular, and it is typically composed of organic compounds such as polysaccharides (mostly chitin), proteins, and lipids. Pioneering research on bivalve shells and their organic matrices has been done since at least the 1800s. Other than geologists and palaeontologists, few chemists found interest in this biomineral . An exception was Edmond Fremy (1855), who, in his quest to describe as many as possible biominerals from the animal kingdom, came across molluscan shells, thanks to a collaboration with a certain M. Valenciennes (Fig. 2). After applying his standard decalcification protocol to marine shells, he obtained an insoluble, shiny organic substance he named *conchiolin* after its similarities with ossein. Conchiolin had, however, a different chemical behaviour from ossein, and he also points out the presence of a carbohydrate, chitin, a trait he found shells' share with arthropod exoskeletons and cnidarian skeletons. This is also one of the first times that researchers found how much these invertebrate exoskeletons have in common with human skeletons, a parallel that is still an active field of research (Loh *et al.,* 2021, Clark *et al.,* 2020).

A lot of shell literature followed the work of Fremy, although some of this material is now difficult to access and often requires translations from different languages. Fast-forwarding to the 20th century, we see that renewed, international interest was developed in the 1960-80s. While the presence of an organic matrix within shells was well established, we see more and more attempts to characterize it in increasing detail. It was known that a large part of the shell organic matrix was composed of proteins, and with their amino acid characterization, Weiner & Hood (1975) provided evidence that shell proteins are rich in negatively charged amino acids. Weiner & Traub (1980) with their improved x-ray analysis of the insoluble protein fraction of the matrix confirmed that it displays similarities with silk fibroins and has a β-sheet conformation, probably in an antiparallel fashion. As new instruments emerged and were more widely accessible, Weiner, Talmon & Traub (1983) published the first analysis of organic matrices with electron diffraction patterns. Strikingly, the observations from these and many concomitant experiments, still make up a lot of the ground theory and assertions in the biomineralization field. At the same time, biomineralization scientists started to come together since at least 1970, when the first international symposium was held in Germany. An account of the progress since their second international meeting can be found in the Science bulletin from 1977, where Towe paints a rather negative picture (Fig. 3).

No overlaying mechanism is observed, and scientists are baffled by the immense number of structures, their complexity, and the absence of an observable common underlying mechanism. Recent biomineralization review papers similarly state that, despite the newest developments in the field, the complex variety of three-dimensional shell morphologies is largely unexplained (Clark *et al*., 2020). While this is true, the fact is that the field of biomineralization has greatly grown, several scientific groups from all over the world revolve around it, innumerable datasets have been collected and ever more structures have been investigated. Flourishing information and the development of ever more advanced equipment has led to even further investigations opening new debates and reshaping questions.

The main organ in charge of the complex biomineralization apparatus is the mantle. The mantle is a relatively thin tissue that overlays both valves and stretches as needed to tackle multiple tasks within and outside of shell formation. There is also evidence that other cells could be involved in biomineralization in different species (see for example Sillanpää *et al*., 2016), however, the mantle remains the best studied. Gene expression analyses of mantle tissues have greatly increased the amount of information we possess on molluscan biomineralization. Nevertheless, the picture remains puzzling, and this is in part due to the enduring neglecting of molluscan genomes as well as the fast evolutionary speed of biomineralization genes which make phylogenetic comparisons difficult especially when no dominant molluscan model species has yet emerged. However, a renewed effort is now being put into expanding our databases and more information is flowing in, thanks to international collaborations (Davison & Neiman, 2021). It has been repeatedly observed that there are high rates

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Biomineralization

The Mechanisms of Mineralization in the Invertebrates and Plants. Papers from a symposium, Georgetown, S.C., Oct. 1974. NORIMITSU WATABE and KARL M. WILBUR, Eds. Published for the Belle W. Baruch Institute for Marine Biology and Coastal Research by University of South Carolina Press, Columbia, 1976. xiv, 462 pp., illus. $27.50. Belle W. Baruch Library in Marine Science, No. 5.

Traditionally, students of biomineralization (hard-tissue formation) have been divided into two main groups—those who emphasize the process and those who emphasize the product. Studying the process involves the source and concentration of the organic and inorganic components and their movement to the sites of mineralization, and studying the product involves the microarchitecture, mineralogy, crystallography, and organic composition *at* the sites. Any general model of biomineralization must relate process and product in a comprehensive fashion.

This book is a collection of 21 papers presented at a second international symposium. (The first was held in Mainz, Germany, in 1970.) The papers are generally of high quality and accurately reflect the state of research on invertebrate biomineralization, but serious readers of the volume will be disappointed to find out that no general mechanism has yet been uncovered that ties process and product coherently together. I hasten to add that this is not the fault of the organizers of the symposium or of the 41 contributors but rather is open testimony to the intractability of the problem itself.

The opening review papers desperately seek to grapple with the problem of bringing process and product together.

None is successful, and one even confuses the issue further with semantic recommendations that result in some misleading statements such as, ''It is no longer acceptable to consider the occurrence of mineralized deposits as evidence of calcification.'' In the remaining papers studies of a variety of organisms, dominated, as usual, by the mollusks, are reported. Calcium minerals are seen in all sizes, shapes, and degrees of crystallinity. Organic matrices are recognized and crystal compartments and templates are postulated. Carbonic anhydrases and calcium-binding glycoproteins seem ubiquitous. The variety of minerals grows as the number of organisms studied increases and the data accumulate, yet the underlying mechanism of mineralization seems as exasperatingly remote as ever—process and product remain separated. H. K. Erben in his ''Concluding remarks'' observes in understated fashion, ''This second international symposium [cannot] claim to have given final answers to the fascinating riddles we are confronted with.'' Unless some new insights or dramatic experimental results are forthcoming a third international symposium is likely to make even less real progress toward the goal of understanding invertebrate biomineralization than did this second.

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17 JUNE 1977

Fig 3. Review of papers published after the second biomineralization symposium (Georgetown, USA, 1974). Printed in *Science* 196 (4296) pp 1311.

of lineage-specific gene co-option and loss from mantle tissues, rapid evolution of coding sequences (Aguilera, McDougall & Degnan, 2017), and extensive duplication of shell matrix protein families (Miyamoto *et al.,* 2013, Takeuchi *et al.,* 2016). Since molluscs produce the highest diversity of biominerals of any animal group, the evolvability of the mantle could provide a molecular explanation for this (McDougall & Degnan, 2018). Whether this confers any selective advantage to molluscs, however, or whether it is a byproduct of the molecules necessary for shell assembly, is not known (Kocot *et al.,* 2016). Exploring these questions would be key to understanding the adaptation potential for this group in the face of rapid environmental change.

The complexity behind shell formation is further enriched when we include increasing evidence for epigenetic post-transcriptional regulation of biomineralization processes through microRNAs (Zheng *et al.,* 2016) and long noncoding RNAs (Zheng *et al*., 2020). In addition, the Mediterranean mussel genome has been reanalysed and has been found to contain an unexpectedly high number of dispensable genes for an animal (Gerdol *et al.,* 2020). Dispensable genes are characteristic of microorganisms such as bacteria, and they are correlated with the ability to respond to selection and inhabit new niches, something that bivalves, which (1) survive in extreme environments, (2) are often exposed to highly fluctuating environments and (3) can be cosmopolitan, have in common with microorganisms. This feature is likely to be found in other bivalves with invasive species traits. All of these observations are important to link the thought of a shell as a solid, rock-like immutable structure and the fact that a great diversity of bivalve and molluscan shells exists, not only between but also within species. For example, the plasticity of shell formation is particularly evident in certain groups such as cementing oysters that create shells so polymorphic that often, species identification based on shell morphology is impossible (Xia, Yu & Kong, 2008). Contrary to all predictions, mussels have been reported to quickly modify their shell structure to adapt to changes in the environment and predation pressure (Telesca *et al*., 2020). It has also been suggested that rapid responses to environmental stress are facilitated by maintaining high genetic diversity in the brooding population (Bitter *et al.,* e2019). In fact, mussel larval shells size can be sustained even in very low pH seawater through fitter genotype and phenotype selection (Bitter e*t al.,* 2019). Therefore, the lack of observations of a clearly defined biomineralization genetic tool and common shell architecture, even within closely related species, is not all that surprising. Clearly, their genetics offer a unique of opportunities for us to learn about plasticity and evolutionary biology.

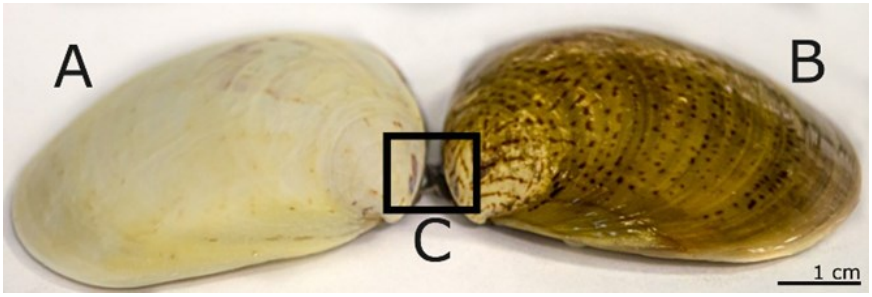

Fig. 4. Adult hard clam shell (*Meretrix* sp.). A) Bare valve after removal of the periostracum, B) valve with original periostracal cover and C) shell ligament.

The making of the bivalve shell begins very soon after fertilization. Bivalves are spiralian animals that undergo unequal embryonic cleavage until bilateral cleavage of dorsal cells triggers the establishment of the unique doubling of the dorsal shell (Kin *et al.,* 2009). It is believed that the bivalve cleavage pattern is highly conserved, and that canalisation of development is key to the establishment, and maintenance, of the bivalve body plan (Kin *et al.,* 2009). A series of cell signalling will initiate the formation of the so-called *shell field*—an early organic matrix,

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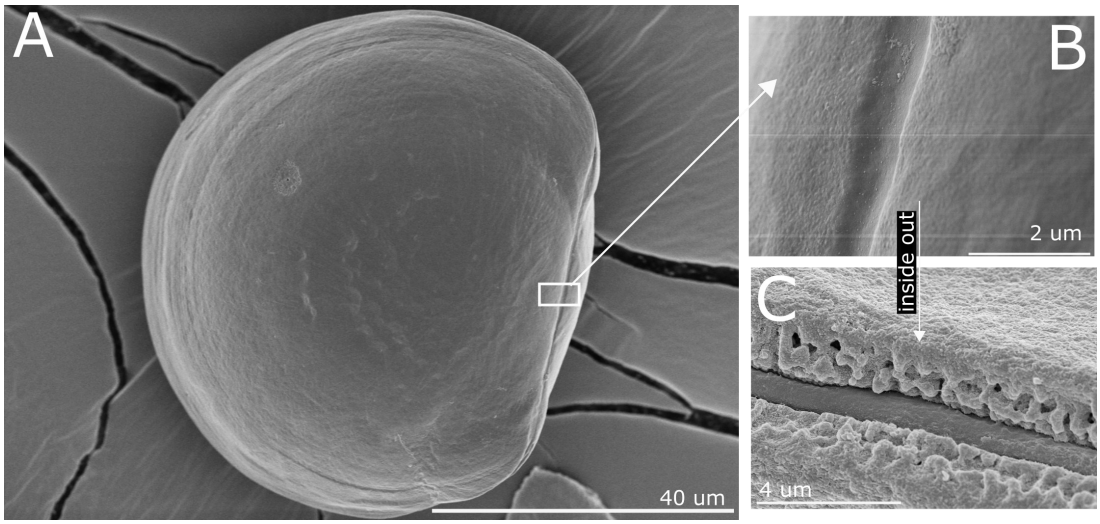

Fig. 5. Example of a bivalve larval shell imaged using scanning electron microscopy. A) Entire Hong Kong oyster larval shell. B) Details of the larval ligament structure from outside the shell and C) view from inside.

which flattens the trochophore larva into a version of the bivalve body frame with which we are familiar (Fig. 5A). Mineral deposition co-occurs upon the organic matrix and at high rates, relatively much higher than in adult counterparts. The bivalve larva mass has been observed to be 90% shell which needs to be deposited by relying mostly, if not exclusively, on the energy provided by the maternal oocyte (Waldbusser *et al.,* 2013). The first bivalve larval shell, which is called a D-shell, is similar among different species with very divergent adult shell morphology. Differently from the settled, mature versions of the bivalve shells with which we are familiar, the larva in its shell is microscopic, free-swimming, and in many species, fully planktonic. Despite all these differences and metabolic challenges, the larval shell already includes all of the features that will also make up the adult shell: distinct layers of $CaCO_3$, hinge ligament, periostracum, and a diverse organic matrix proteome.

The periostracum and the ligament are hardened organic layers, mostly proteinaceous. These structures are visible in the first larval shell (Fig. 5 and 6) and are retained and further developed in the adult counterpart (Fig. 4). Ligament formation is initiated by specialised cells during larval development after valve partitioning (Mouëza *et al.,* 2006) and supports bivalve motility throughout its life. The ligament maintains its elasticity while keeping the valves tightly sealed yet flexible, and is a composite of crystals and an unusual combination of proteins (Suzuki *et al.,* 2019). Similar to a tough insect cuticle, these structures are sclerotized, probably through quinone tanning of soluble proteins (Waite, 1977) and they are produced by the mantle like the rest of the bivalve shell. By contrast with the ligament, the periostracum is not mineralized, although intraperiostracal calcification is not uncommon in adult bivalves (Checa & Harper, 2014). As most clearly observed by transmission electron microscopy, the periostracum encloses the newly formed larval shell from hinge to mantle edge and it is the first observable part of the larval shell (Mouëza *et al*., 2006). One of the prime functions of the periostracum is to provide waterproof support and a substratum for the growth of the outer shell layer (Taylor & Kennedy, 1969). An external organic layer is necessary to isolate the calcification space to create that highly concentrated fluid for $CaCO_3$ deposition and to avoid immediate shell dissolution. The periostracum layer is the key player in more corrosive waters such as polar, subpolar, and low-salinity environments (Telesca *et al.,* 2019). In these habitats, mussels within the same species modulate shell formation by secreting a thicker periostracum and a less calcified shell as compared with their lower latitude relatives (Telesca *et al*., 2019).

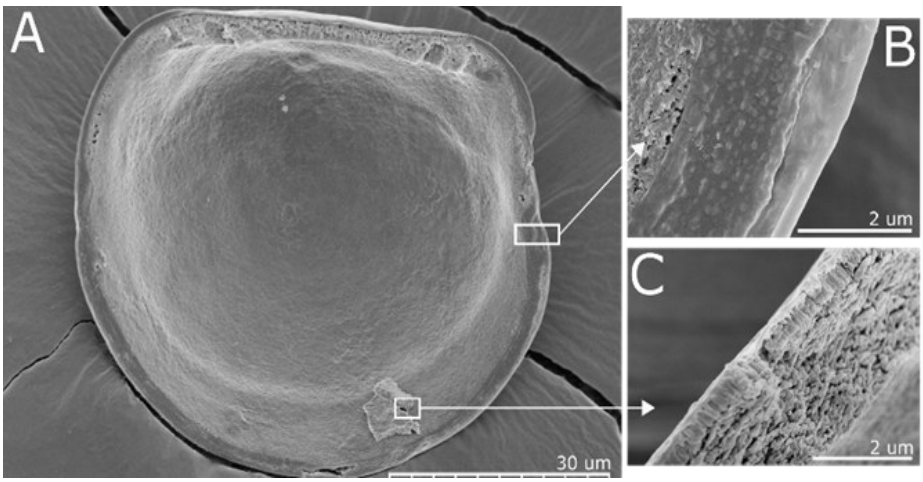

Fig. 6. Bivalve larval shell example imaged using scanning electron microscopy. A) View inside a larval shell valve. B) Details of the larval periostracal cover and C) view of larval shell layers from a broken shell fragment.

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Another adaptation is to increase the organic component within the shell itself. It has been suggested that shells have become more calcified and less organic over time, possibly due to the high metabolic cost of secreting the organic matrix (Palmer, 1992). Therefore, this is not necessarily the best approach to produce more functional shells, at least not on an evolutionary time-scale. It was also proposed that the introduction of calcite to replace aragonite was a cheap innovation for protection from dissolution as *calcite* is less soluble than *aragonite.* These are the two main $CaCO_3$ polymorphs assembled by bivalves: aragonite is harder and stronger, but it is also more soluble than the "cheaper" calcite. It is widely accepted that the primitive molluscan shell was wholly aragonitic (Taylor, 1973). While the bivalve larval shells are all still composed of aragonite, many adult bivalves, such as mussels, include a calcitic layer right under their periostracum. Since this layer would be more at risk of interacting with seawater especially during early deposition, it could indeed be beneficial against dissolution. Whilst aragonite is a more soluble polymorph, there is little evidence that aragonite layers are more soluble than calcitic ones in cold waters (Harper, 2000), but several studies on the effect of decreased pH show a more pronounced negative effect on aragonitic layers as compared to calcitic ones (reviewed in Byrne & Fitzer, 2019). It has been argued, therefore, that aragonitic shells were difficult to maintain and secrete during highly corrosive ancient calcite seas and that during these times the acquisition of a calcitic shell layer was advantageous (Harper, Palmer & Alphey, 1997). Reversing mineralogy is a costly business (Porter *et al*., 2010) and, therefore, the layer might have been maintained since.

When rapid calcification is required, as during embryonic development or new edge growth, granular homogenous structures are observed (Schoeppler *et al*., 2019). As the granular layer grows, the number of crystal nucleation centres decreases and the $CaCO_3$ layers transition in a predictable manner to columnar and then nacreous following a directional solidification model (Schoeppler *et al*., 2019). Nacre, mother of pearl, is easily the most commonly known structure, for its beautiful appearance and commercial value (Fig. 7). Not surprisingly, it has also been the model biomineralization structure in molluscan shell studies. A well-known nacreous material is also the oyster pearl, which is essentially an inside-out shell, with the periostracum at its centre (McDougall *et al*. 2021). Pearls are arguably the most impressive piece of biomaterial produced by molluscs, and the most valuable (at least from a human perspective). Other than its beautiful appearance, nacre is known for being the strongest of all molluscan microstructures (Checa, 2018). Nacre's architecture can absorb 1–3 times more mechanical energy than prismatic calcite and monolithic aragonite before total failure (Gim et al., 2019). Nacre also contains a large proportion of organics, compared to other layers, and these can help restrict crack propagation both within and between tablets, sustaining the overall architecture and allowing further structural loading (Gim *et al*., 2019).

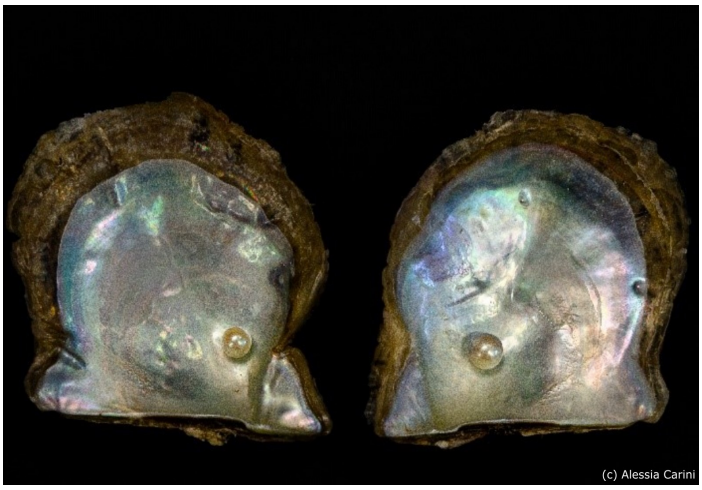

Fig. 7 Mother-of-pearl comprising nacre

Similar sequences of different shell layers are found in calcitic oyster shells, from outer prismatic to the inner foliae layer which is an analogue to nacre. Nacre has evolved multiple times in different lineages (Jackson *et al*., 2010) following the *directional solidification* model. These microstructural sequences, based on thermophysical, and chemical laws, appeared repeatedly during evolution (Checa, 2018: Schoeppler *et al.,* 2019). An example is that calcitic foliae have developed independently in bivalves and gastropods, even though they form a weaker structure than nacre (Checa, 2018). While the large number of microstructures produced by molluscs is impressive, how have bivalves created just the right environment, for their assembly if the $CaCO_3$ abiotic version is so uncomplicated and seawater conditions unfavourable? The answer seems to be that the physical and chemical boundaries for shell secretion are controlled by the direct action of the mantle and then remotely through the secretion of the extracellular conchiolin.

As observed by Fremy in 1855, molluscan shell conchiolin includes a polysaccharide, chitin. Chitin is frequently used by organisms for structural support and probably contributes to the mechanical strength of the shell (Chan *et al*. 2018). Not all shells show evidence of chitin however, and therefore, the abundance and role of chitin in molluscan shells have been debated. When present, it associates with proteins and the mineral phase. For example, in the pearl oyster, crystal defects become larger as chitin fibres are degraded by chitinolytic enzymes (Kintsu et al., 2017), and in the Eastern oyster when the mineral phase or proteinaceous fractions are dissolved, the chitin fibrils growth is stunted (Chan *et al.,* 2018). There is evidence for chitin presence in the bivalve larval shell as well, where it strongly interacts with proteins (Weiss & Schönitzer, 2006).

Shell matrix proteins have received the most attention in recent years, probably due to advances in mass spectrometry. Models based on molluscan nacre proposed that the bulk of shell proteomes is composed of silk-like proteins with gel-like properties that are interspersed within the mineral tablets (Addadi *et al*., 2006). Indeed, several protein sequences similar to silk have been extracted from bivalve shells and often possess chitin-binding domains. It is reasonable to conclude therefore, that silk-like proteins and chitin provide structure to the matrix and the shell. In addition to silk-like proteins, classical models also include negatively charged proteins which have long been hypothesised to interact with positively charged calcium ions and therefore playing an active key role in biomineralization (Weiner & Hood, 1975).

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In addition to these components, it is well established that shell proteomes are characterized by repetitive, low complexity domains that have a biased composition and evolve rapidly by continual recruitment, deletion, and duplication (McDougall, Aguilera & Degnan, 2013).

Most studies regarding the characterization of the shell organic matrix have focussed on nacre. We know from several proteomic studies however, that different mineral layers can have large differences in their shell proteomes (eg. Marie *et al.,* 2012). Further, shell proteomes vary strongly with ontogeny (Zhao et al., 2018) and environmental fluctuations (Arivalagan *et al*., 2020). While proteins are estimated to only account for 1-5% of the shell weight, shell proteomes are quite diverse, and proteomics studies have accumulated a high number of sequences that often do not trace back to any known protein or function. However, functional studies have provided evidence for some long-hypothesized functions of soluble SMPs such as crystal nucleation (Feng *et al.,* 2009), CaCO3 phase determination (Suzuki *et al.,* 2009), initiation and inhibition of calcification (Sikes *et al.,* 2000) and controlling crystallization patterns (Checa *et al.,* 2016). Other than I improving the structural properties of bivalve shells, playing an active role in calcification and bivalve shell evolution, the organic matrix moulds the bivalve shell into a biochemical barrier for the animal. The identification of shell proteins with immunology-related domains used to be troubling, as they are associated with cellular functions and, were therefore, thought to be contaminants. The frequent identification of proteases, metalloproteinases, and protease inhibitors from shell proteomes, even after harsh biomineral cleaning, has now produced new scope for shell studies in the light of biochemical defence against pathogens. These expanding datasets and observations require new, updated, comprehensive models for the bivalve shell matrix that, while consolidating the traditional, well-established knowledge, also appreciates the novelty and nuances of newer findings.

The fact remains that after decades of research, we are still baffled by these invertebrates' resilient creations. The mechanical superiority of these shells offers great opportunities for us to create new bioinspired materials (Clark *et al.,* 2020) and to explore their value for human health, with applications in wound healing, tissue engineering, and bone regeneration (Loh *et al.,* 2021). Bivalves, and in particular their shells, are ecosystem engineers as they reshape their environment and create new homes to countless creatures while also providing an effective natural carbon sink (Fig. 8).

Clearly, bivalve shells are more than just relics on the beach, but issues such as overconsumption, habitat loss, pollution, and climate change, to name a few, put at risk many of these species and their highly specialized shells. Even if it were not for our own consumption, health benefits, or ecological roles, understanding shell formation is important to the safeguarding of the incredible shell diversity that has fascinated geologists, biologists, chemists, and the public alike and, importantly, their millennia of natural history.

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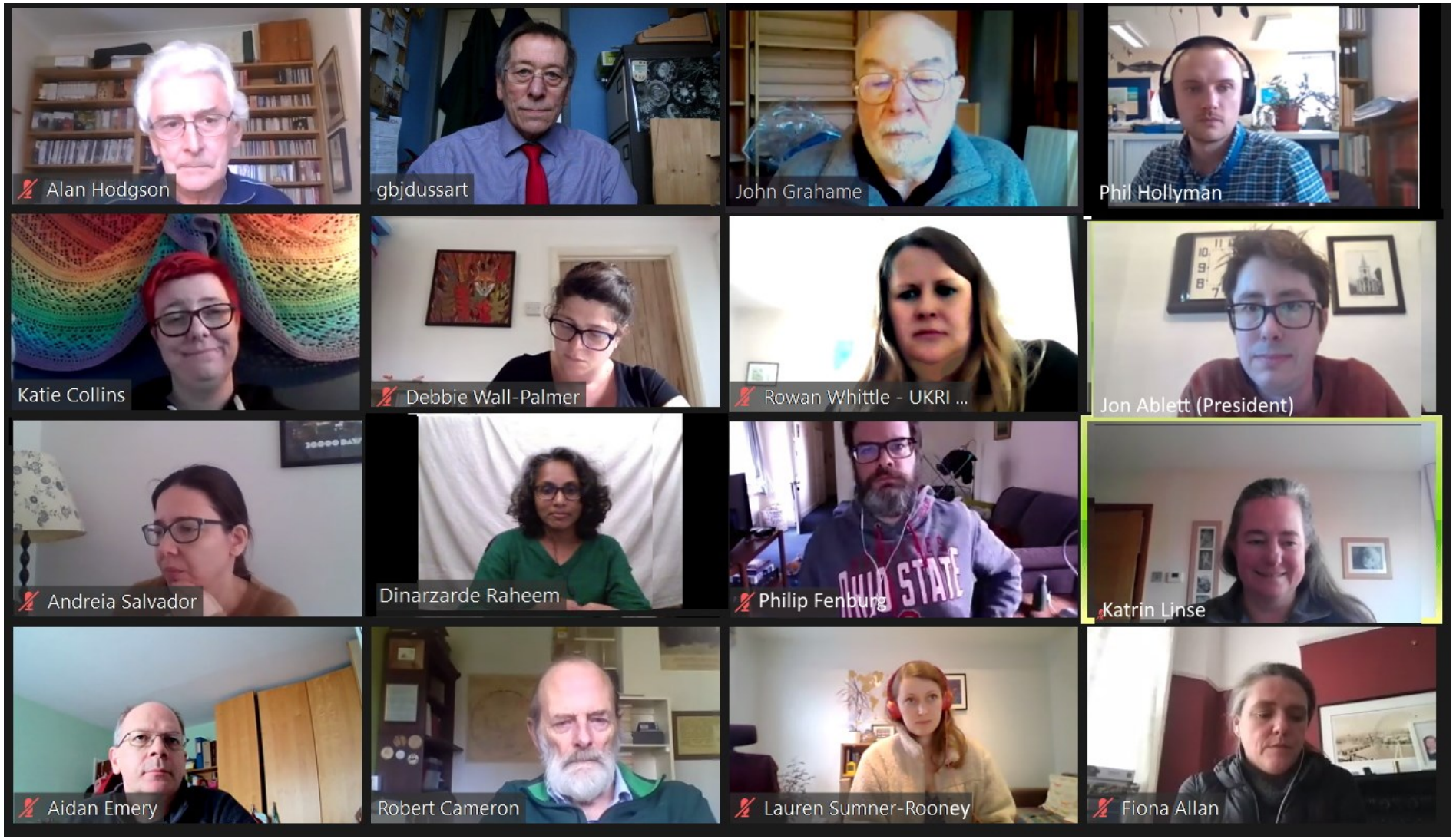
Fig. 8. Examples of ecological functions served by bivalve shells such as rock oysters. Oyster reefs create habitats for other species such as gastropods, chitons, crustaceans, and algae. Oyster reefs change the structure of rocky shores and the oysters, therefore, are ecosystem engineers. Location: Lantau Island, Hong Kong.

Editors note ~ This review was solicited from Alessia Carini after she presented a paper at the Malacological Forum. I suggested the review because I have a special interest in the subject of conchiolin, since I had analysed the amino acid composition of several species of freshwater gastropods in relation to water hardness for my doctoral thesis, presented in 1973.



AGM meeting by Zoom 24 March 2021 - Council members

MEMBERS OF COUNCIL AT THE VIRTUAL AGM

Early Career Research Grant Reports

Research financially supported by the Malacological Society of London

Taking advantage of contamination: Molecular analyses of solenogaster midgut contents to determine food sources

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In 2018, The Malacological Society of London provided an early career research grant to Lukas Ostermair to support his master thesis. We are very excited that results of this project are now published as a Correspondence piece in *Current Biology*.

In his master's thesis, Lukas tested a molecular approach to investigate the food sources of Solenogastres, a class of worm-shaped and shell-less molluscs. Traditionally, anthozoan cnidarians were proposed as the main food source of these marine molluscs, as undigested cnidocysts were often found during histological investigations of the midgut (Salvini-Plawen 1981), or based on live feeding observations of large-sized species (e.g. Sasaki and Saito 2005). For this project, gut contents were indirectly sequenced from genomic DNA extracts of almost 200 specimens of deep-sea Solenogastres assigned to more than 60 species, constituting their currently known diversity the deep Northwest Pacific (Bergmeier et al. 2019). We used a universal primer pair targeting the nuclear 28S rRNA region and took advantage of a known amplification problem in solenogaster nuclear genes (i.e. their complex secondary structures usually hamper standard PCRs and instead result in contaminations amplified from gut contents (Okusu and Giribet 2003; Meyer et al. 2010)).

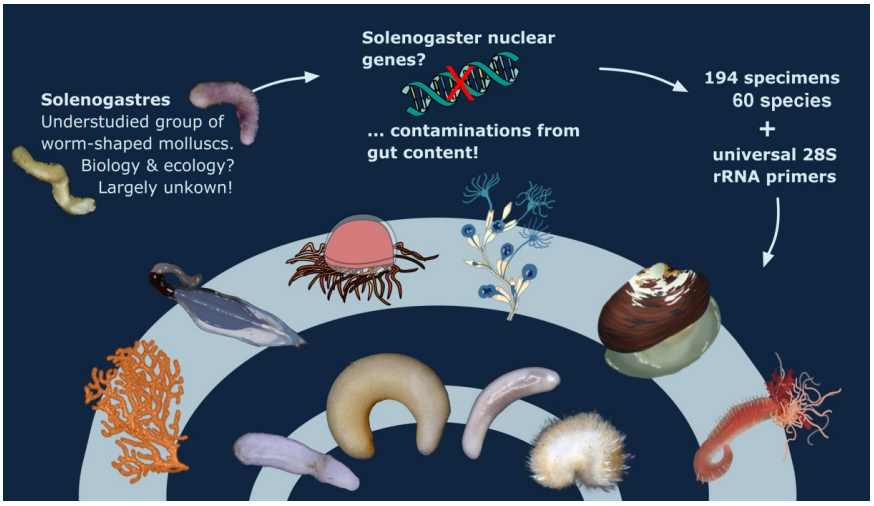
This indirect sequencing of gut contents allowed us novel insights into the feeding ecology of these molluscs. In short, we discovered more than 26 food sources from four different phyla. In addition to cnidarians and annelids, the studied Solenogastres also prey on nemerteans and bivalve molluscs. The majority of investigated solenogasters species seem to have highly specific prey preferences, feeding only on a single food source. Surprisingly, a generalist feeding strategy was only documented in one species. Cnidarians still constitute the most common food source in Solenogastres, but in addition to anthozoans and hydrozoans, some species also prey on benthic siphonophores or scavenge on jelly-fall.

Finally, we plotted these food sources onto a phylogeny of the investigated solenogaster species and discussed the findings in an evolutionary context. The experimental procedures of this project are detailed in the Supplemental information of the publication.

We would like to thank *The Malacological Society* for funding this student project, which resulted in this study on solenogaster food sources and allowed us to gain a better understanding of what's on the menu for these enigmatic molluscs.

The publication is available from the journal's homepage through a subscription or we will happily share it via e-mail (franzi.bergmeier@gmail.com):

Bergmeier FS, Ostermair L, and Jörger KM (2021). Specialized predation by deep-sea Solenogastres revealed by sequencing of gut contents. *Current Biology* 31(13): R836-R837, https://doi.org/10.1016/j.cub.2021.05.031.



Graphical summary of the research project. Inner blue semicircle with some of the investigated Solenogastres species; outer blue semicircle with some of the sequenced food sources (from left to right: Alcyonaceae (Cnidaria), Monostilifera (Nemertea), Trachymedusae (Cnidaria), Leptothecata (Cnidaria), Nuculanida (Mollusca), Terebillida (Annelida)).

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Author's note

In 2018, my student Lukas Ostermair received a junior research grant for his master's thesis. We now have finally published the results as a Correspondence piece in *Current Biology*. I would like to thank the Society again for their support, especially in relation to young students.

Mussels under threat: combined impacts of ocean acidification and pharmaceutical contamination on *Mytilus edulis*

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Ocean acidification, the "evil twin" of global warming, is known to be a threat to calcifying molluscs (Gazeau *et al.,* 2013). Increasing atmospheric carbon dioxide is absorbed by the oceans, decreasing seawater pH and reducing the bioavailability of carbonate ions which are key for calcifiers to build shells and skeletons. In addition, the changes in carbonate chemistry induced by ocean acidification have the potential to change the chemical behaviour of marine contaminants. The associated reduction in seawater pH can alter the bioavailability and toxicity of ionisable organic contaminants to marine organisms. Species which lack the ability to maintain their extracellular acid-base status in ocean acidification conditions, such as the blue mussel *Mytilus edulis*, may be particularly at risk from this; their internal carbonate chemistry mirrors that of the surrounding seawater, and therefore chemical changes to pollutants could also take place inside their bodies, resulting in altered toxicity effects (Lewis *et al*., 2016).

Alice Wilson-McNeal conducting some muddy fieldwork in the Exe Estuary, UK.

Research into these potential interactions between ocean acidification and contaminant toxicity for mussels and other molluscs is lacking, despite their potential susceptibility. I designed an experiment to test the hypothesis that the limited ability of *M. edulis* to regulate its acid-base status in response to ocean acidification will cause predictable changes to the toxicity of contaminants. In the experiment, individual mussels were exposed to one of two pharmaceutical drugs at present-day seawater pH and carbon dioxide concentrations, or at simulated pH and carbon dioxide concentrations predicted to be present in the oceans by the year 2100 according to the Intergovernmental Panel on Climate Change. Based on their chemical behaviour, we predicted the toxicity of one of these drugs should increase in this ocean acidification scenario, whereas the toxicity of the other should decrease. We measured haemolymph carbonate chemistry to measure the strength of the mussels' response to ocean acidification, metabolic rate and ammonia excretion rates to investigate energetic effects, and antioxidant activity and oxidative stress as measures of drug toxicity. The combination of these endpoints would give us an overall picture of the mussels' general health status as well as the specific effects of the drugs in ocean acidification conditions.

***Mytilus edulis* in experimental tanks.**

The experiment was set up in March 2020 but we couldn't access our labs or wild mussels due to the covid pandemic. The Malacological Society graciously offered to extend the duration of the grant, and we were able to postpone the work until restrictions were eased. In the meantime, we marine biologists had to get creative with working from home. I took the opportunity to read more literature than at any other time during my PhD, and came across an additional assay for when we got back into the labs. This assay would give us a greater understanding of the neurophysiological effects of the pharmaceutical drugs.

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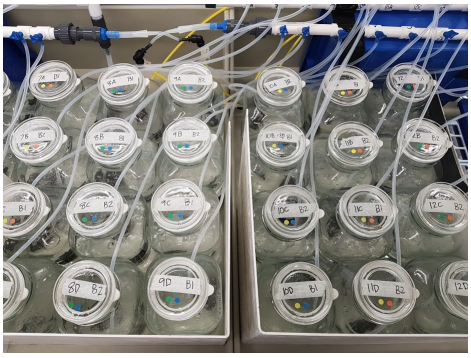
Once we were able to get back into the lab, socially distanced of course, it was a race against time to have the work completed before the mussels' spawning season as this would interfere with their normal physiology. We collected almost one hundred mussels from the Exe estuary and transported them back to the Exeter University aquarium facility. After some fine-tuning of carbon dioxide concentrations in the tanks and confirmation of the experimental doses of the drugs, mussels were finally added to their tanks in September 2020 – six months later than planned. After two weeks we were able to explore the effects of each of the six treatments to the mussels. Whilst changes in acid-base physiology caused by ocean acidification appeared to affect the toxicity of the two drugs, this was not as clear-cut as we had expected. Some parameters were affected far more than others, and the drug which was expected to become less toxic in ocean acidification conditions had greater effects on some endpoints. The mussels' physiological responses to ocean acidification probably influenced the toxicity of the contaminants, but the exact mechanisms are not fully understood.



Experimental tanks aerated with an air/CO_2 mix to simulate end-of-century ocean acidification conditions.

We are indebted to the Malacological Society of London for providing an Early Career Research Grant to conduct this research. This enabled the purchase of additional chemicals to run liquid chromatography-gas spectroscopy analysis of seawater chemistry to validate the findings and additional equipment for experimental work using carbon dioxide. Thank you to my supervisors Dr Ceri Lewis and Dr Rod Wilson for their guidance in writing the grant proposal and designing the experiment, and to Katherine Colvin and Will Davison for their assistance with field and laboratory work. This work was also supported by the University of Exeter Vice Chancellor's Scholarship for Postgraduate Research. We hope to publish the results from this research this year.

Measuring ecotoxicological parameters in the lab.

Using shotgun sequencing for disentangling a taxonomic jumble: the case study of the skeneimorphs

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Introduction

The Gastropoda comprise the most diverse class of Mollusca, including between 40,000 to 150,000 species adapted to live in all environments. This astonishing diversity has hindered a comprehensive understanding of their evolutionary history, leading to multiple alternative classifications [1] and the subsequent creation of taxonomical categories that do not represent natural groups.

The family Skeneidae Clark W., 1851 represents an extreme example of such taxonomic conundrum. This family traditionally includes hundreds of species in dozens of genera that are characterized by a minute shell (usually 0.8–2 mm) without nacre, a rhipidoglossate radula and a multispiral operculum [2]. However, more detailed morphological and molecular studies have proved their polyphyletic nature and the name "skeneimorphs" was claimed to be more accurate for these snails [3]. For instance, although the family Skeneidae has been assigned to the superfamily Trochoidea [4], some specimens should be considered members of the superfamily Seguenzioidea [3], and there are even cases of former skeneimorphs that belong to the subclass Heterobranchia [5].

Molecular studies could help us overcoming this situation. In particular, mitochondrial genomes have been widely used to infer the evolutionary history of different gastropods, and to define a robust classification of these groups [e.g. 6]. In the summer of 2017, I visited the lab of Professor Yasunori Kano (University of Tokyo) aiming to amplify the complete mitochondrial genomes from several species of skeneimorphs from his collection. However, the low amount of DNA (due to the size of these snails), the lack of specific primers (given their polyphyletic origin) and the quality of the probably fragmented DNA, hindered my approach. The main goal of this project was to overcome these limitations by establishing a new methodological pipeline, sequencing low coverage genomes from three skeneimorph species. This would be instead of using the traditional PCR-based approach.

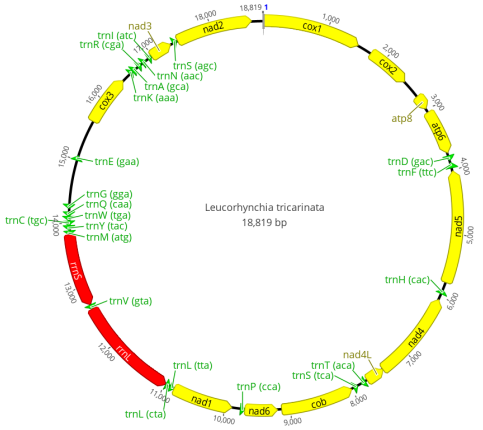

Figure 1 – Annotated mitochondrial genome of *Leuchorhynchia tricarinata*. Diagram generated with Geneious.

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Materials and Methods

Three species were selected: *Dillwynella vitrea, Leucorhynchia tricarinata*, and *Protolira thorvaldssoni*, collected between 2003 and 2012 and preserved in 100% ethanol. Total genomic DNA was extracted from whole specimens using the Qiagen DNeasy Blood & Tissue Kit. Samples were then sent to Macrogen, where an indexed library per sample was constructed using the TruSeq Nano DNA Kit and sequenced in an Illumina NovaSeq platform with a sequencing depth of 30GB.
Raw reads were corrected for potential sequencing errors using Rcorrector [7], adapters were removed using Trimmomatic, and reads were quality trimmed using Prinseq v.0.20.4 [8]. Mitochondrial genomes were assembled using NOVOPlasty v.4.2 [9] and annotated by comparison with other Vetigastropoda genomes. Additionally, in order to assess the minimum sequencing depth required to recover complete mitochondrial genomes, reads were randomly sampled to generate 2, 5, 10, 15, and 20GB files. All reads were mapped to the assembled mitochondrial genomes using Bowtie2 v.2.2.6 [10] to separate the nuclear reads, which were then assembled using SPAdes v.3.14.1 [11]. Genome completeness was assessed using BUSCO v.3.0.2 [12].

Results and Discussion

Mitochondrial genomes have been widely used for inferring phylogenetic relationships within Gastropoda, and have helped in the definition of several trochoidean families [6, 13]. Based on this experience, mitogenomes were chosen to study the polyphyletic Skeneidae and identify those species that could belong to different families, but the traditional PCR-based approach was largely unsuccessful. Genome skimming techniques allow the assembly of complete or nearly-complete mitochondrial genomes and the annotation of nuclear markers just from DNA extractions, and it has been successfully used in other contentious groups [14].

Between 144 and 211 million reads were generated per species. The complete mitochondrial genome from *L. tricarinata* (Fig. 1) and *P. thorvaldssoni* were recovered. The mitogenome of *D. vitrea*, however, was not circularized. Instead, two fragments of 14,400 and 3,300 bp were assembled. Successive attempts improved this result, although a small fragment between the *trnD* and the *trnS* genes was still missing. During the quality control of the extraction, the Macrogen lab team detected a high degradation in this sample, which could explain this result. All mitochondrial genes could be annotated however, proving the reliability of this approach for assembling and annotating the (nearly) complete mitochondrial genome of these minute skeneimorphs.

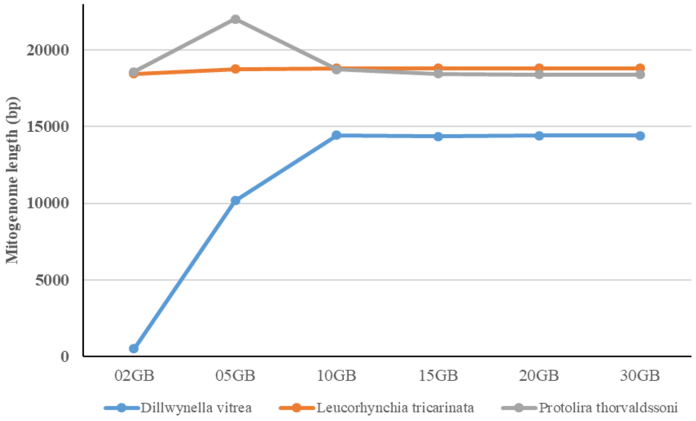

Figure 2 – Sequence lengths of the mitogenomes assembled at different sequencing depths for the three species: *Dillwynella vitrea* (blue), *Leuchorhynchia tricarinata* (orange), and *Protolira thorvaldssoni* (gray).

Aiming to identify the minimum sequencing depth required the assembling of a complete skeneimorph mitogenome. Different depths were simulated by randomly sampling 6, 16, 33, 50 and 67 million reads for each species. For *L. tricarinata* and *P. thorvaldssoni* , virtually no differences were found among attempts, as the complete mitochondrial genome was recovered in all cases. Small variations in length were detected however, due to the differences in the assembly of the repetitive control region (Fig. 2).

By contrast, *D. vitrea* was more troublesome, as at least 10GB were necessary to replicate the results of the full dataset. Based on this experience, DNA quality (or integrity) seems to be an important factor for recovering a complete mitochondrial genome, although this limitation can be bypassed by increasing the sequencing effort [15].

Although most of this work was focused on mitogenomes, a big portion of the nuclear genome was also assembled (Table 1), representing between one third and a half of the vetigastropod *Haliotis rufescens* genome [16]. All three genomes were highly complete, with more than 65% of the metazoan BUSCO genes present in all cases. As expected for a genome assembled from short reads, they are highly fragmented, with the highest N50 of the three in 13,923bp, as reported for other species [e.g. 17].

Table 1: Basic statistics of the assembled nuclear ge-

	D. vitrea	*L. tricarinata*	*P. thorvaldssoni*
Total length (bp)	838,389,779	627,445,078	511,601,414
Number of contigs	737.371	264,380	376.317
Largest contig (bp)	148.918	367.191	232,540
N50	3.154	13.923	2.873
BUSCO (C/P/M)*	35.9/30.6/33.5	82.2/12.5/5.3	44.7/31.6/23.7

*Percentage of C = Complete; P = Partial; M = Missing genes

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Future work

This project was conceived as a proof of concept to evaluate the performance of genome skimming for studying skeneimorph gastropods. After these successful results, this protocol will be now extensively applied to other skeneimorph samples, aiming to identify highly divergent lineages that might represent independent families. Thus far, one of the goals included in the proposal was inferring the phylogenetic position of the Skeneidae within Trochoidea. However, the inferred tree topology was highly variable depending on the analysis. This project will surely benefit from an increased taxon sampling.

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Book reviews

Molluscan genomics: broad insights and future directions for a neglected phylum

Angus Davison and Maurine Neiman

Published by the Royal Society in special issue 1825 of volume 376
Print ISSN:0962-8436 Online ISSN:1471-2970

Genome sequencing seems now so commonplace, a critical part of the Covid-19 response, embedded in personal healthcare, and the reporting of genome sequencing of 'newsworthy' organisms, that it would be understandable if the general public held the misperception that genome sequencing was trivial, with the science at a stage where any organism could have its entire genome sequenced quickly, cheaply, with apparently little effort. It is preaching to the converted to argue that molluscs display a wide variety of phenotypes of interest addressable through genomic methods. Why then are, particularly high-quality molluscan genomes, under-represented in genome databases, how can this be changed, and what even can we learn from molluscan genomes? This special issue of *Philosophical Transactions of the Royal Society*: 'Molluscan genomics: broad insights into future directions for a neglected phylum' reports on a meeting, 'Pearls of wisdom: synergising leadership and expertise in molluscan genomics' held in 2019 and considers, in a series of 14 papers, particular aspects of, or challenges to, molluscan genomics. From technical difficulties in extracting the high molecular weight DNA necessary for genome sequencing (molluscs seem to have evolved a number of characteristics which make this extremely difficult), right through to front-end database availability of genomes accessible by all, and from the current knowledge of epigenetic modification of genomes through to the state of play of molluscan phylogenomics.

The introductory paper to the volume by Angus Davidson (University of Nottingham) and Maurine Neiman (University of Iowa), the meeting conveners, sets the scene for these diverse papers, explaining the current state of play of molluscan genomics and the (quirky) history and rationale for this conference.

Adema reviews difficulties with extracting high quality molluscan DNA, something anyone studying molluscan genetics will be abundantly aware of. This article clearly presents the issues affecting extraction e.g. mucopolysaccharides and pigments, and difficulties with qualitative assessment of molluscan genomic DNA, an article I am sure will be extremely useful to all undertaking such procedures.

We sit at an exciting juncture where not only are large national (e.g. Darwin Tree of Life project) and international efforts underway to sequence the genomes of all species but individual labs can feasibly sequence whole genomes. In recent years the Oxford Nanopore Technologies (ONT) sequencer, a device that in its simplest form is a small USB powered sequencer, has been demonstrated to be deployable anywhere from field diagnostic laboratories in Liberia to the International Space Station. However, the latest iterations of this and the bioinformatics methodology to deal with these data make it usable in any laboratory for genome sequencing. Sun *et al.* take molluscan ONT data and benchmark a range of assembly pipelines offering advice for the optimum methods dependent on the size and heterozygosity of your molluscan genome.

To be useful, molluscan genomes must be accessible, not just as raw data available only to those with the necessary bioinformatic skills, but through freely accessible online genome databases. Caurcel *et al.* present MolluscDB (https://molluscdb.org/) an access route for both currently available and future mollusc genome assemblies. Whole genomes represent a rich dataset for phylogenetics and molluscan phylogenetics (with contentious evolutionary relationships, particularly within classes) may benefit greatly from the large datasets genomics can provide. Sigwart *et al.* consider where research activities should be directed in future years to optimise the utility of these, noting not that although most molluscan diversity remains unsampled, current genome sequences are typically from recently derived taxa and future efforts must concentrate on early diverging branches and groups with poor sampling (e.g. Aplacophora, Schaphopoda, Polyplacophora).

Whole-genome sequencing data opens up a swathe of opportunities for understanding the driving forces of speciation. Chueca *et al.* use data from two species of the terrestrial pulmonate *Candidula* to dissect the role, and extent of gene flow, to understand ecological speciation in these snails.

Whole mitochondrial genomes have been attainable for longer than whole (nuclear) genomes, although they now can be extracted from whole genome data. Ghiselli *et al.* review the current knowledge on the gene content and organisation of molluscan mtDNA and the utility of these sequences in a phylogenetic context.

The term 'model organism' is widely used in biology. In their paper, Davison and Neiman discuss why there are no molluscan model organisms and what criteria must be met for any mollusc to be regarded as such, including the genomic and genetic resources necessary.

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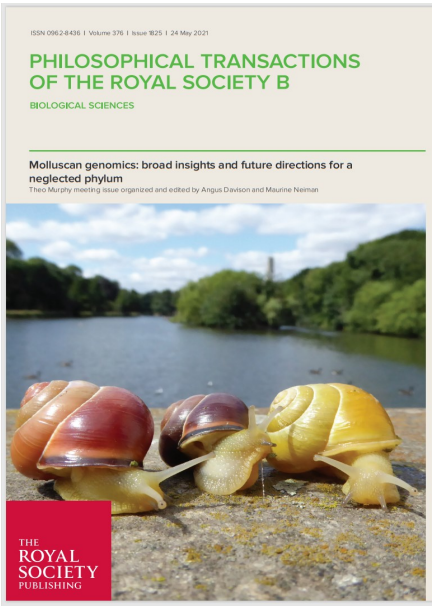

Other papers are perhaps more relevant to those interested in molluscan molecular genetics. Rosani *et al.* review current knowledge concerning molluscan miRNAs (non-coding regulators of gene expression) and Männer *et al.* consider a potential epigenetic regulator of gene expression, methylation, inferring methylation patterns across 140 molluscan species. Calcino *et al.* show that molluscan genomes not only show evidence of hemizygous regions (with large chromosomal sections differing in presence/absence) but that these regions typically contain genes involved in transposition, DNA repair and stress response. Other structural variation is detectable in oyster (*Crassostrea virginica*) genomes (Modak *et al.*). These duplications contain either genes or exons and are hypothesised to underpin this species' adaptive and evolutionary success. McCartney utilises genomics and classical genetics to locate and study the genes involved in byssus production from a *Dreissena polymorpha* genome assembly, comparing byssus proteins with those from quagga and blue mussels. Molluscs of aquacultural importance are perhaps over-represented in the (limited) available genomes. Potts *et al*. discuss how genomic data and technologies may aid in improvements to disease resistance including how genomic data can be interrogated for suitable loci for CRISPR modification. Finally, Seppälä *et al*. discuss the adaptive evolution of the gastropod immune response, reviewing the studies on this and discussing how genomic, or more particularly transcriptomic data may provide insights into this.

This volume is therefore not just a collection of papers detailing molluscan genomes, but a state-of-the-art summary, offering suggestions, both technical and reflective for how to move forward. Whilst it will, unsurprisingly, be likely of most interest to those directly involved in genomics (and not just of molluscs), it contains a variety of papers of interest to many broad molluscan interests, and demonstrates the utility of genomic data to throw light on important questions in molluscan biology.

Dr Craig Wilding
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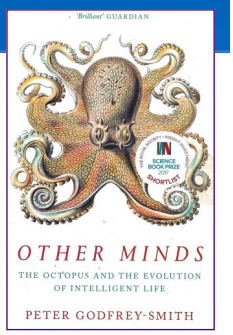
Book and film

Other minds; the Octopus and the evolution of intelligent minds

by Peter Godfrey Smith (2018). Pubished by William Collins, London ISBN: 978-0-00-822629-9

BBC iPlayer - Natural World - 2019-2020: The octopus in my house

Presented by Professor David Scheel



Peter Godfrey Smith (PGS) begins the book by describing 'Octopolis', an octopus 'city' over which he scuba dives on a shallow sea floor on the east coast of Australia. Octopolis is a habitat to which the author returns several times during the narrative. It is a rather strange biotope, in that octopods are not usually social animals.

The author takes an evolutionary approach to the question of how sentience, intelligence and consciousness fit into the physical world. As a philosopher, he wants to know how it feels to be an animal such as a cephalopod – "If we want to understand other minds, the minds of cephalopods are the most other of all" emphasising that "this is a philosophy book as well as a book about animals and evolution".

Early in his narrative, PGS describes what is meant by 'seeing' for a bacterium, including both the seeing its environment and seeing its bacterial colleagues. The relevance of this to malacology is that, for example Hawaiian squid host bacteria in their body. The bacteria produce light through a quorum-sensing mechanism, and the host squid incorporates the process into its development of camouflage.

Two possible narratives for the development of multicellularity are discussed, comprising sponges and comb jellies. The author observes that Ediacarans in the Precambrian beds near Adelaide may have had little to do with each other "munching on the mat (of) filtered food from the water … hardly interacting at all", since there is little evidence of predation. It seems that at this time, the nervous system was used for coordination rather than the sensori-motor control as used for, for example, in the processes of defence or attack. PGS then nicely obfuscates his own argument by raising the issue of jellyfish stings. Who was being stung, and why?

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The Cambrian metazoan explosion is described as a process of animals being "involved in each other's lives". Through natural selection and evolution this leads to the production of eyes, antenna and claws, The book is peppered with nuggets of biology - for example box jellyfish can navigate, moving at three knots, by watching external landmarks on the seashore. Eventually, complex, active bodies arise in only three taxa, these being the chordates, arthropods and cephalopods. The writing is both poetic and enigmatic in places, for example "until in one example of this sensory and behavioural entangling, a rubber encased mammal and a color changing Cephalopod find themselves staring at each other in the Pacific ocean" PGS moves on into the evolution of molluscs, pausing on *Nautilus* as a lone survivor with 200 million years of heritage.

Homing in on the Cephalopods, PGS observes that they evolved to "smart". He examines the mismatch between experiment and anecdote as a familiar problem in animal psychology, but it is particularly relevant to octopus behaviour. He describes experiments and observations on the extraordinary behaviours of cephalopods in the open sea, in Octopolis and in the laboratory.

Mammal brains can be mapped but it is difficult when the octopus has most of its neurons in its arms. Because of recurrent neural connections, octopuses have a form of short term memory in the arms. Nevertheless, in experiments, the octopus uses its eyes to guide its arms through a maze to a reward. The arms may also have sufficient independence to do some local exploration, self-motivated by the arms. PGS asks why an octopus has as many as 0.5 billion neurons and investigates ideas of primate behaviour developed by Katherine Gibson in the 1980s. Gibson firstly identified food gathering that requires little manipulation, for example a frog catching an insect. Secondly there is extracted foraging where choices are made within the context, for example removing food from protective shells. In relation to this, PGS reconsiders the evolution of nervous systems, contrasting sense or in motor views with action-shaping views, suggesting that the first nervous systems were primarily for coordination within the organism. He suggests the octopuses central nervous system imposes a top down order but also allows turned each arm to be an intermediate scale actor. Thus, the octopus has a kind of mixed (nervous) economy. The outcome is that it is not clear to us where the brain ends in an octopus, since the nervous system runs throughout a body which has "no parts, an old joints, no natural angles".

What it feels like to be another organism in its world is then considered. He investigates the ideas of consciousness, discussing issues such as perceptual constancy (how an object remains recognisable of the same object as the viewpoint changes) and nervous integration in a range of taxa, concluding that brain activity which leads to visual experience causes the building of an inner model of the external world in the nervous system. In exploring consciousness, the author takes the example of pain, noting that some animals don't seem to feel pain. For example, they don't groom or protect an injured part of the body but just continue with whatever they were doing. He points out that subjective experience comes from the modulation of the nervous system, that is, from registering things that matter and not just merely running the nervous system. In developing this argument, PGS invokes the work of Dehaene, Barrs, Millner and Goodale, seeing consciousness as a useful term for subjective experience that is "unified and coherent in various ways". He takes the special case of the octopus, describing a range of experiments which reinforce the idea that octopuses have delegated a certain amount of local control to their arms. At this point, PGS again wonders what it would be like to be an octopus. For the octopus nervous system, PGS accepts the metaphor that it may resemble jazz improvisation, where the final result emerge as out of a continued give and take of musical information between the players.

The colour changes of the giant cuttlefish is next for consideration. PGS is puzzled by the metabolic cost of the immensely expressive colour changes in an animal that apparently does not have colour perception, and in relation to cephalopod camouflage asks "How can you match colors you cannot see?" The relationship between colours and behaviour of shapes is explored; for example, when are a cuttlefish holds its arms up like horns, in an aggressive gesture. Many of these engaging examples of relationships between the observer and the Cephalopod take place in Octopolis and PGS describes examples of the animals exhibiting blatant curiosity, with associated colour changes. As a general biologist, I was pleased to see that PGS includes an analysis of the mechanisms of these colour changes. The descriptions in the book are eloquent but to really assimilate what is happening, I recommend the BBC video available at
BBC iPlayer - Natural World - 2019-2020: The Octopus in My House

Here, David Scheel Professor at Alaska Pacific University spends a year in a personal relationship with an octopus in an Octopolis in the USA. Finally in relation to colour, PGS concludes that colour changes in the giant cuttlefish are an inadvertent expression of the animals inner processes; he offers colour plates in evidence and again, his thesis is efficiently supported by the BBC film documentary.

The book now enters a more philosophical vein, passing from Hume to Vygotsky via Darwin. The relationships between speech and thinking in humans is explored by reference to the psychologists' use of the concepts of System I (thinking uses habits and intuitions) and System II (which is slower, users proper rules of reasoning, and tries to look at things from several angles, being "ponderous and powerful"). At this point, I notice a comment I have written on a page in the book "*has he abandoned the cephalopods now?"* but this is not a negative criticism. PGS can't stop being a philosopher and so, he makes an excursion into thinking about one's own thoughts. As this stimulating chapter ends, the author brings his readers back to the molluscs.

The short life of a cephalopod allows PGS to start wondering why anything gets old and dies, and he discusses the possibility that the death of aging individuals saves resources for the young, thereby benefitting the species. The evolutionary principle of mutation-selection balance is examined, including the logic that individuals who live long and without deleterious mutations are likely to have more offspring. By contrast, everyone will carry some mutations and it will appear to an observers that they have been programmed to decline. PGS develops his argument by considering semelparous and iteroparous life cycles. Semelparous organisms have-big bang reproduction, producing offspring in a single short season. Iteroparous organisms produce several generations over a more extended period. Female octopuses are an extreme case of semelparity since they die after a single pregnancy.

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First encounter

Exploration of a relationship

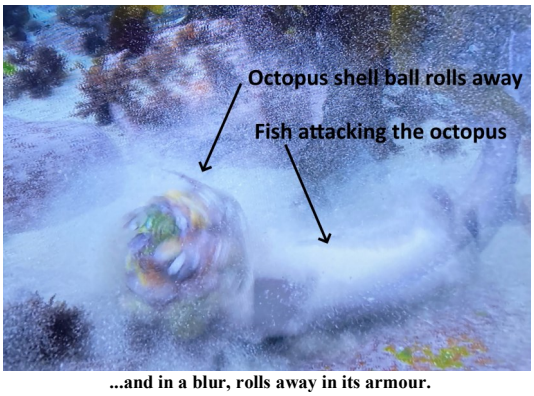
The den

A bitten off arm regrows

A child gets involved

As a protection, the octopus forms a ball, armour plated with shells

It is investigated by a predatory fish…...



...and in a blur, rolls away in its armour.

Some still images from The octopus in my house

In the final chapter PGS returns to Octopolis, recounting days when he would see more than a dozen octopuses roaming, grappling or just sitting in an area a few metres in diameter. In an observation supported by the BBC documentary, he engagingly describes a Nosferatu pose where a startled octopus colours itself black and raises a dark cloak of mantle forward, over its head. PGS wonders how Octopolis could originats, and comcudes that it is caused initially by octopuses eating scallops and leaving their shells as debris. In a positive feedback loop, this debris allows other octopuses to dig out further stable dens so that the environment comprises more and more of the shells themselves, in a case of ecosystem engineering. All this seems to lead at Octopolis to an unusual social life of high densities and continuous interaction.

Finally, PGS summarises his argument in relation to the cephalopods and extends it into the negative impacts humans activities have on oceans. The film also ends on a pensive note, when the main cephalopod protagonist comes to the end of its natural life. Its death evidently deeply affects its human companion.

I found the book and the film created a thought-provoking synergy, and I strongly recommend both to anyone who nurtures an interest in molluscs.

Reviewer - Georges Dussart

Annual report of Council for 2021/202

delivered by the President, John Grahame at a Virtual Annual General Meeting

MEMBERSHIP– no report

FINANCE for the financial year ending 31st December 2020 (reported by Katrin Linse).

Significant activities

In 2020 the Malacological Society of London had proposed meeting at the Marine Biological Association in Plymouth on "Limpets 2020" that had to be cancelled with a week's notice due to Covid-19, and the annual Molluscan Forum for Young Scientists was held virtually. The Society published the members' bulletin "The Malacologist" and in cooperation with Oxford University Press the "Journal of Molluscan Studies".

Public benefit

The charity's objects are for the public benefit because increasing public knowledge is required as molluscs form an important part of the global biodiversity and ecosystem stability which can have effects on human health and are a human food source.

ACHIEVEMENT AND PERFORMANCE

Charitable activities

In 2020 the main charitable activities were the funding of eleven research projects, of which nine claimed the grants (total cost of £13,342.25), eight to young researchers and malacologists in non-permanent positions and one to senior researchers, the support of 3 students and young researchers to attend conferences and training courses, an activity highly impacted by Covid-19 as the Society usually supports around 20 scientists here.

FINANCIAL REVIEW

The finances of the Malacological Society have been pleasing during 2020 with an overall gain of £52263. This gain is explained by a gain in the Fixed Interest and Investment funds and lower awards and meeting expenditure.

Our investments had an overall gain of £28,997 (comparing market value at 31 December 2020 with market value at 31 December 2019), with the COIF Investment Fund making a gain of £25,132 and the COIF Fixed Interest Fund a gain of £3,865. During 2020, no funds were transferred from the current account to savings accounts.

Separately, the profit-share from the publication of the Journal of Molluscan Studies in 2020 provided the Society with most of its income contributing £49,396. The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal. In addition, sales of the digital archives provided £506.50 of income.

In 2020, more funds were used for research awards, being £13,342k in 2020 compared to £8,696k 2019, while travel awards remained similar, but there was reduced spending on Council meeting and Forum travel awards as meetings after January 2020 were virtually. The Society (MSL) spent less money in 2020 compared to 2019, this was mainly based on less expenses paid for meetings and to the JMS editor for attendance expenses Malacological conferences to promote our journal and network with potential assistant editors and authors.

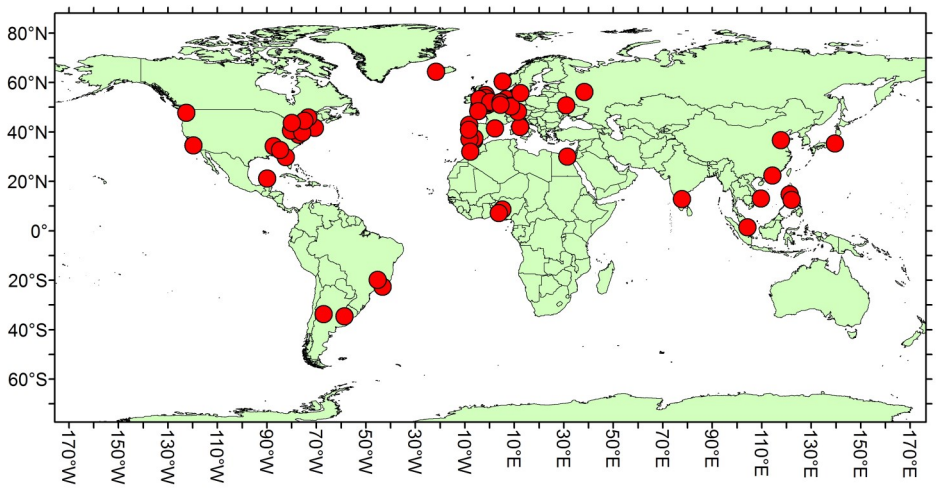
MEETINGS

The AGM

The 127th AGM was held as a virtual meeting *via* Zoom, on the 4th of June, the same day as the June Council but as a separate meeting. Very unfortunately it was not only delayed by problems arising from the Covid-19 pandemic, but also was unaccompanied by any malacological presentations because the anticipated Limpets 2020 meeting was necessarily cancelled at very short notice.

***The Molluscan Forum* reported on by Phil Hollyman**

The annual molluscan forum was held on the 19th of November 2020, for the first time this meeting was hosted virtually *via* Zoom. Over 170 people registered in advance for the event, representing about double the delegates of recent in-person meetings. The shift to a virtual platform had a clear impact on accessibility for international delegates, improving the ability of many people to attend and present.



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This year also saw the introduction of quick-fire talks in place of poster sessions, giving each speaker five minutes and two slides to present their findings. Overall there were 50 applications for full and quick-fire talks, which were presented during three full and three quick fire sessions throughout the day. **The Oxford prize, awarded annually for the best early career talk, was given to Lauren Eggleton (Sheffield University) for her talk titled: 'A Sticky Situation: Investigating the Contradictory Nature of Gastropod Mucus'.**

PUBLICATIONS

***The Malacologist* reported on by Georges Dussart**

In the 2020-2021 operating year, two issues of The Malacologist were posted to the website.

The August issue always includes the President's report of Council, which summarises the activities of the Malacological Society of London over the previous year. Issue 75 (August) of The Malacologist was an extended edition of 53 pages; this pagination largesse was partly due to papers which discussed the future of the Malacological Society of London. There was also an unusually large number of research reports. An article by Robert Cameron on The future of the Society and the Journal of Molluscan Studies in the age of Open (and digital) Access led to articles by Trevor Parry Giles (Crafting a new normalcy) and Robert Harington (Why scholarly societies are vitally important to the academic ecosystem). The research reports included Cryptic and invasive freshwater Galba snails by Pilar Alda, Towards a first molecular phylogeny of Caecidae micro snails by Christina Egger et al., Preliminary data on the biodiversity of solenogasters in the China Sea by M. Carmen Cobo, BrdU-based sperm-labelling protocol in a hermaphroditic freshwater snail species by Yumi Nakadera et al. and Physiological performance of an invasive freshwater gastropod under elevated CO2-induced acidification by Andrew A. David. As always, it was gratifying for the Society to receive a report from an Annual Award winner, in this case Samuel Abalde's report on Phylogenomics and comparative transcriptomics of West African cone snails. The issue also included a book review and two memoria (John Allen and Ron D'Or). Finally, the issue included an invited article from Jake Goodall et al. entitled Emerging from the shell: development of the common whelk as a novel model of phenotypic variation. The invitation arose from a series of Forum presentations given on this subject by the Icelandic group.

The February issue (76) of *The Malacologist* had, as its core, the abstracts of the Molluscan Forum for 2020. This 41-page issue included two research grant reports. Kiran Liversage et al. reported on Intertidal molluscs on the ecologically dynamic Saurashtra peninsula (Gujarat, India) and the report from Eduardo Sampaio, concerned Disentangling multi-partner effects on collaborative hunting between octopus and fishes. As increasingly happens for research reports, this report was associated with video recordings. The issue included an essay from Council member Robert Cameron which summarised his experience of academic publishing over the past decades; Robert intriguingly entitled the essay Tales from the Palaeolithic. Robert's essay was prompted by the termination of paper-printing of the Journal of Molluscan Studies (JMS); paper issues are now replaced by digital-only access. This event also prompted the article written by Alan Hodgson, another Council member, From print to on-line, a historical review of the Journal of the Malacological Society of London which reviewed the history and editorship of the JMS since its inception. A further contribution by Council members in this issue was the position paper from Lauren Sumner-Rooney on Diversity, Equality and Inclusion in the Malacological Society of London prompted by the 'Black Lives Matter' movement.

The Malacologist continues to present a useful synoptic view of malacology, especially amongst young researchers. The Malacologist has an ISSN number (ISSN 1759-1406) and is therefore citable, so it is in the interest of awardees to present reports on their Society-funded research or travels.

***The Journal of Molluscan Studies* reported on by Dinarzarde Raheem**

The ISI impact factor for the *Journal* in 2019 increased to 1.461 (compared with 1.345 in 2018, 1.483 in 2017, 1.250 in 2016 and 1.185 in 2015). The *Journal* stands at number 63 in the ISI list of 168 zoological journals (it was 65 out of 170 in the previous year). Our chief competitor, *Malacologia*, had a remarkably high impact factor of 13.50 in 2019, reflecting the fact that during the two-year citation window there has been just a small number of citable items in this journal, of which one (Bouchet *et al.*'s 2017 classification of gastropod and monoplacophoran families) has been cited nearly 300 times. The *Journal* continues to be truly international in terms of the geographical distribution of its authors; for volume 85 (2019) the corresponding authors represented 19 countries (of which the leaders were 16% Germany and 13% Japan). The average publication time from receipt to Advance Access publication was 10.4 weeks for 2019.

Circulation for the Journal in 2020 was 55 institutional (of which 36 were online-only and 19 print-only) and 156 membership subscriptions (compared with 30 and 157 respectively for 2019). In addition, a further 2,530 institutions have electronic access to the Journal through publishers' collections (includes migrated figures; compared with 2,348 in 2019).

The new pricing structure has been fixed for 2021. The Journal moved to being online only from January 2021, with the cost for an online-only subscription set at £552. Please see https://academic.oup.com/mollus/subscribe for more information.

Volume 86 (2020) contained 45 papers, research notes and review articles, totalling 434 pages (the preceding volume totalled 452 pages). In total, 127 manuscripts were submitted in 2020 (an increase of 8.5% on the 117 in 2019) and the acceptance rate was 33%. The image of the chiton *Chiton albolineatus* on the cover of Volume 87 was kindly donated by Douglas J. Eernisse.

Our board of Associate Editors is now: Coenraad Adema (immunology, genomics, parasitology), Thierry Backeljau (molecular phylogenetics and genetics), Liz Boulding (population and reproductive biology), Robert Cameron (ecology and genetics of terrestrial gastropods), Richard Cook (agricultural malacology, physiology, feeding behaviour), Simon Cragg (life histories, sense organs), Mark Davies (marine ecology and behaviour), Dan Graf (freshwater bivalves), John Grahame (population genetics, morphometrics), Liz Harper (marine bivalves), Gerhard Haszprunar (microanatomy, 3D reconstruction, minor molluscan classes), Bernhard Hausdorf (terrestrial gastropods), Michal Horsák (ecology and biogeography of

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terrestrial gastropods), Yasunori Kano (systematics of vetigastropods, tropical ecology), Joris Koene (reproductive behaviour of gastropods), Manuel Malaquias (opisthobranchs), Peter Marko (marine biogeography and phylogenetics), Pablo Martín (freshwater ecology, life history), Ellinor Michel (ecology, freshwater gastropods), Jeff Nekola (community ecology of terrestrial gastropods), Nicolas Puillandre (neogastropods), Ellen Strong (freshwater and marine caenogastropods), Janet Voight (cephalopods), Janice Voltzow (microscopic anatomy), Heike Wägele (opisthobranch biology), Tony Walker (biochemistry, immunology, cytology), Suzanne Williams (molecular phylogenetics and genetics), and Yoichi Yusa (general ecology and behaviour). Nerida Wilson has temporarily stepped down from the editorial board.
I would like to thank all the members of the editorial board, those members of the international malacological community who have contributed to the review process, the staff of Oxford University Press, particularly Cailin Deery and Jan Webster, and the production teams at Aptara Incorporated (led by Akash Mahajan) and SPi Ltd, Philippines (led initially by Mackie Fernandez and latterly by Ronel Mirano and Erica Fajardo), for their work on behalf of the *Journal*.

WEBSITE reported on by John Grahame and Tom White
Stefan Senk (http://www.senktec.com/stefan-senk/), who built the current website, is in the process of making some much needed revision and overhaul of it. John Grahame has started up the learning curve of editing the site, to bring its content up to date. This is very much a work in progress.

FACEBOOK & TWITTER reported by Chong Chen and Lauren Sumner-Rooney
The Facebook page continues to be a useful and well-used part of our Web presence. It has proved particularly valuable in communicating information the Society wishes to publicise quickly.
This year we have also set up a Twitter account to enhance communication. This has also proved successful – set up in July 2020, it has attracted 383 followers with 64.4K views of Tweets.
If you have suggestions / comments on these pages, please do not hesitate to contact Chong Chen, *Facebook Manager* or Lauren Sumner-Rooney, *Twitter Manager*.

AWARDS (reported by Jonathan Ablett)
Overall, the Society is very pleased with the number of applications that it receives for Travel Awards and Research Grants however the number of applications received for Travel Awards was severely reduced due to the current global health situation. The schemes seem to be achieving their global aim to enable young scientists to engage in malacological research activity both in the laboratory/field and at meetings. Citable reports from researchers, funded through both schemes, appear in *The Malacologist*.
The Society aims to make the following awards annually.
Travel Awards - at least 5 each of up to £500 for Society members, £300 for non-members
Research Grants - at least 5 each of up to £1500
Application forms and guidance notes for both schemes have been updated recently and can be downloaded from The Society's website.

Travel Awards
In 2020 there were 2 rounds of Travel Awards, June and December. Due to the global Coronavirus pandemic the Society only received 1 application for awards to travel and was able to fund this request. All Travel Award applications are reviewed by an Awards Committee. The Society is pleased to have announced the following awards.

June Travel Awards
No applications received and no awards made.

December Travel Awards
Hannah Lee (Heriot-Watt University)
£300 for attendance at 'NORA 4 (Native Oyster Restoration Alliance)' Middelburg (The Netherlands),
4th – 6th May 2021

A total of **£300** was allocated by The Society for Travel Awards. All applicants have been notified of the outcome. Note that this amount does not necessarily reflect actual 'spend' as occasionally students withdraw from the intended visit.

Research Grants for 2020 - Senior Research Grants & Early Career Research Grants
The society award both Senior Research Grants and Early Career Research Grant. Early Career Research Grants are conferred on students and researchers without professional positions, but without regard to nationality or membership of The Society. Senior Research Awards are aimed at established researchers in professional positions, but without regard to nationality. Applicants for Senior Research Awards must be members of The Society. Early Career Research Grants will be reviewed by MSL council members and Senior Research Grants will be reviewed by a Reviewers Panel including both council and non-council members invited for that purpose.
4

Early Career Research Grants
By the closing date of 15th December 2020, the Society had received 10 applications from workers from 10 institutions in 6 different countries. In general, the scientific quality of the research projects submitted was excellent.
On behalf of the Society, I would like to formally thank the members of the Grants Review Panel for their hard work in reviewing all applications. The Panel has agreed the following awards, in alphabetical order.

A. Bhosale (Foundation for Biodiversity Conservation, India), **£1500**
'A survey of the land-snail fauna of the northern Western Ghats, India'

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A. Buckner (University of Lincoln, UK), **£1255**
'Immnological respond of *Glaba truncatula* when infected with *Fasciola hepatica*'
C. Drerup (Cambridge University, UK), **£1500**
'Adaptions to visually challenging environments in cuttlefish'
H. Lipae (University of the Philippines Los Baños, Philippines), **£1500**
'Diversity and Community Assembly of Camaenid Land Snails in Karsts on Luzon Island'
L. Martin (Institute of Marine Sciences, University of Portsmouth, UK), **£1500**
'Laboratory testing of the efficacy of novel furfurylation treatments and naturally durable, tropical hardwood species against settlement by larvae of the shipworm, *Lyrodus pedicellatus* and other teredinid molluscs.'
O. Ojeda (University of Málaga, Spain), **£1250**
'Molluscan fauna of mud volcanoes of the north-eastern Gulf of Cádiz: biodiversity and eco-biological aspects.'
K. Zając (Jagiellonian University, Poland), **£1500**
'Removing taxonomic obstacles in the genus *Deroceras* by means of integrative redescriptions of selected taxa.'

Therefore **7** Research Grants have been funded at a total cost of **£10,005.** The success rate was **70%**. The Grants Review Panel would like to emphasise that the quality of all applications was high and that it funded as many excellent projects as possible. Applicants have already been formally notified of the outcome of their application.

Senior Research Grants
By the closing date of 15th June 2020, the Society had received only 1 application for the Senior Research Grants. On behalf of the Society, I would again like to formally thank the members of the Grants Review Panel for their hard work in reviewing all applications. The Panel has agreed the following award:
Dr Andrew David (Clarkson University, USA)
£923.42 'Testing the efficacy of a popular synthetic molluscicide (Niclosamide monohydrate) for controlling invasive mystery snails (Mollusca: Viviparidae) in North America).

The Annual Award
The Society received no nominations for the 2020 Annual Award.

The Oxford Prize for Malacology
The Oxford Prize for Malacology is awarded annually for the best presentation at the Molluscan Forum, is generously supported by Oxford University Press, publisher of the Society's journal. The 2020 winner is Lauren Eggleton (University of Sheffield, UK) for her talk entitled 'A Sticky Situation: Investigating the Contradictory Nature of Gastropod Mucus.'

OFFICERS & COUNCIL
This has been my third and final year as President, and it has brought unique challenges. Council met on 22nd January 2020 in the Natural History Museum, aware of reports of a new respiratory virus which had emerged in China but not particularly perturbed by them. What may now seem like complacency would be short-lived. The lead up to our proposed AGM in the context of the proposed Limpets 2020 meeting became a time of increasing anxiety, culminating in the cancellation of the Limpets meeting and the postponement of our AGM. This eventually took place in June (see above) using the Zoom platform, a novelty for many though by no means all of us. One of the discussions was about the Forum, and although the pandemic situation appeared to be improving in June it seemed foolhardy to contemplate a physical Forum symposium for November. Therefore the Forum was moved to Zoom, and proved to be an outstanding success with a stronger international participation than ever (again, see above). Council meetings in June and October 2020 and January 2021 have been in Zoom, we have yet to see how things work in June 2021, and later. While we all long to meet physically again, the Zoom platform has allowed much easier access to meetings for geographically distant councillors, and this has been welcome.
Our *Journal* has moved to online only – a change which would have happened in the not too distant future anyway, but which was brought forward in response to pandemic difficulties. It's in good health and in the hands of an excellent Editor in Chief, Dinarzarde Raheem, supported by a team of Associate Editors. *The Malacologist* with Georges Dussart as editor continues to function as our interesting and wonderfully illustrated newsletter and reporter of the malacology we have supported through Awards. This past 12 months it has documented some of the changes made, as well as the challenges posed by Open Access publishing and Diversity / Inclusivity concerns.
There are changes to Council going forward. I'm delighted that Jon Ablett has been nominated as President, with Fiona Allan as Vice President, joining Phil Fenberg in that role. Heartfelt thanks to those who are standing down from Officer positions – Rowan Whittle as meetings Secretary (succeeded by Debbie Wall-Palmer), Jon Ablett as awards Secretary (succeeded by Lauren Sumner-Rooney), Tom White as membership Secretary (succeeded by Harriet Wood). Welcome to Andreia Salvador as Archivist – so no longer a "Void" in that role! There is no named officer for the Forum – should there be? – Phillip Hollyman has done a sterling job of navigating the Forum over the last two years.
I am grateful to all of Council, as well as those named, for the work you have put into making the *Society* vibrant and vital. The 'unique challenges' of 2020/21 have I think been met, thanks to your efforts and the support given to me – thank you for this. And in closing, a reminder: our most excellent and hard-working Treasurer, Katrin Linse, stands down this year. We need to identify her successor.

John Grahame, President MLS

See next page for the Council at March 2021, and nominations going forward to 2022: CONTINUED >

Year of existence	2020-2021	2021-2022
	127	**128**
President	John Grahame (3)	Jon Ablett (1)
Vice Presidents	Robert Cameron (3)	Fiona Allan (1)
	Phil Fenberg (2)	Phil Fenberg (3)
Ex officio		John Grahame (1)
Councillors	Debbie Wall-Palmer (1)	Alan Hodgson (2)
	Alan Hodgson (1)	Robert Cameron (1)
	Andreia Salvador (3)	Phillip Hollyman (3)
	Fiona Allan (3)	Aidan Emery (1)
	Phillip Hollyman (2)	Victoria Sleight (1)
	Lauren Sumner Rooney (2)	Katie Collins (1)
Co-opted	Aidan Emery	Rowan Whittle (1)
Journal Editor	Dinazarde Raheem	Dinazarde Raheem
Bulletin Editor	Georges Dussart	Georges Dussart
Treasurer	Katrin Linse	Katrin Linse (final year)
Membership Secretary	Harriet Wood	Harriet Wood (1)
Hon. Secretary	Rowan Whittle	Debbie Wall-Palmer (1)
Web manager	Tom White/Chong Chen	John Grahame (web)/Chong Chen (Facebook)
Awards Officer	Jon Ablett	Lauren Sumner Rooney (1)
Archivist	void	Andreia Salvador (1)

'Years' means 'years in post'.
These are limited as described in the objects of the Society

AGM virtual conference

Molluscs in marine environments

Welcomed by the President of the Society, John Grahame
Hosted on Zoom

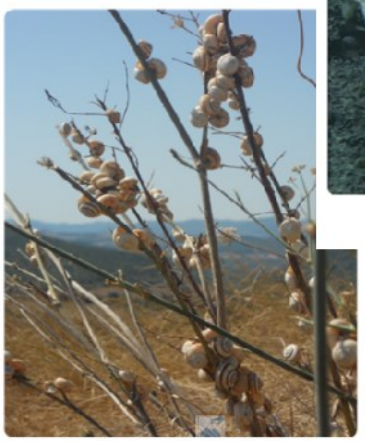
The Malacological Society of London

128th Annual General Meeting
and symposium, via Zoom, on the theme of

Molluscs in Extreme Environments

Wednesday 24 March 2012

Cocculina enigmadonta and *Lepetodrilus concentricus*
Kemp Caldera hydrothermal; Marum ROV



Cernuella virgata escaping soil-surface heat
Heinz-R Kohler *Ecology & Evolution*
doi.org/10.1002/ece3.5607

Registration was free
Harriet Woods handled registrations from Cardiff. Harriet.wood@museumwales.gov

Registration closed on Friday March 19th

organized by the Council, led by John Grahame, supported by
Phillip Hollyman, Katrin Linse, Lauren Sumner-Rooney and Harriet Wood'.

The evolutionary history of molluscs in vent and seep environments

Crispin T.S. Little

School of Earth and Environment, University of Leeds, Leeds, UK
E-mail earctsl@leeds.ac.uk

Molluscs are abundant constituents of modern hydrothermal vents and hydrocarbon seep (aka. methane or cold seeps) sites and this is partially because of the adaptation of many taxa to a symbiotic relationship with chemoautotrophic bacteria in their gills or oesophagus. The taxonomic diversity of molluscs in chemosynthetic environments tends not to be high, but is dominated rather by a few groups, for example bathymodiolin and vesicomyid bivalves, and provannid gastropods. Molecular divergence estimates indicates that some of these diverse taxa are relatively recent arrivals in chemosynthetic environments during the Cenozoic era, and this is supported by their fossil record. However, other groups are older, with Mesozoic origins. Molluscs are present in Palaeozoic vent and seep sites, but these belong to mostly extinct groups, showing that molluscan adaptation to, and extinction within chemosynthetic environments occurred regularly throughout Earth history.

The author sampling fossils from an early Cretaceous seep deposit in Svalbard.

Articulated solemyid bivalve in seep carbonate, early Cretaceous, NE Greenland. Handlens = 1.5 cm diame-

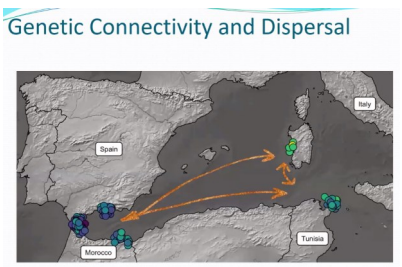
The author (seated with yellow helmet right centre) with students in an open mining pit, Cyprus, from where vent

Saving species from extinction one species at a time

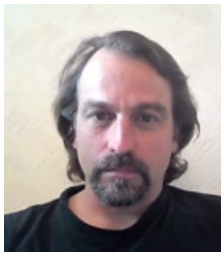
Darren Fa

University of Gibraltar, Europa Point Campus, Gibraltar GX11 1AA
Email - darren.fa@unigib.edu.gi

Darren Fa described the taxonomy, distribution and ontogeny of the endangered limpet *Patella ferruginea*. He identified the distributions of patellids and mytilids across the straits of Gibraltar and discussed the effects of tidal amplitude on P.ferruginea and its local ecotope, including on artificial habitats such as boulder armour used to protect against shore erosion. Conservation efforts were discussed in relation to preferred *P.ferruginea* habitats in the straits. Individual animals were translocated to more benign habitats, with good results for percentage survival compared with resident populations. Fa discussed the possible extension of the species back into the Mediterranean and the importance of stepping stone populations creating genetic connectivity in this process.



Snails in space: a study of vestibular system plasticity



Nikolay Aseyev
Institute of Higher Nervous Activity and Neurophysiology
Russian Academy of Scientists, Moscow, Russia
E-mail: aseyev@ihna.ru

In 2005 NASA and the Russian space agency, Roskosmos, contacted our lab with an invitation to conduct a flight study of gravitational physiology relevance on board an upcoming unmanned satellite Foton-M2. A separate Russian laboratory had to withdraw from participation because of technical reasons. A vice director of the Institute of Biomedical Problems of the Russian Academy of Sciences knew the situation and began to initiate a potential collaboration of NASA scientists and our laboratory . Time was short, the payload had to be less than 2 kgs in weight, and the project could not interfere with any other projects or the spacecraft. Most importantly, the project had to have clear scientific merit. The head of my lab, Pavel Balaban, had the resources on hand, an energetic and enthusiastic team, and accepted the challenge. Because of the success of the Foton-M2 mission we were invited to participate in the Foton-M3 and Bion-M1 missions.

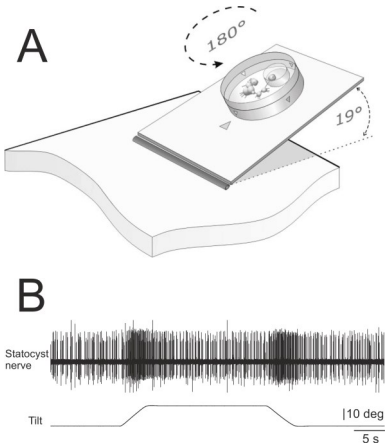
We quickly designed the experiments on our model subject, land snail *Helix lucorum*. These snails are very hardy and resilient, and can survive several weeks without food and water – the conditions expected on the satellite. The weight of the adult snail is about 25 grams, so we were able to launch a reasonably large group of our snail astronauts. Our expectations were correct, and in all three of our orbital missions, we observed no mortality in snails.

The goal of the project focused on the adaptation of the vestibular system of snails to near weightlessness conditions on orbit. We used a systems approach to study the vestibular system employing a wide arsenal of methods. In contrast to marine cephalopod and pteropod mollusks, which use the vestibular system to orient themselves in 3D space, land snails use their vestibular system for vertical movements during the day-night cycle and adapting themselves to circadian temperature changes. Also, the land snails use their vestibular sense for detecting dangerous stimuli, and its activation can mean either the snail is in a fall or under attack from a predator.

In our study to rule out the known confounding factors of an orbital flight and habitat confinement we used 4 groups of additional controls, with different factors controlled, such as temperature, light cycle, food deprivation, congestion and overloading during landing, which was controlled in ground-based control by short centrifugation of snails with 10G.

Our lab participated in 3 flight missions. The logistics of sample return after landing back to our lab was under development by the two space agencies and out of our control. The Foton-M2 snails arrived at the lab after 40 hrs post-landing on commercial airplane routes. This delay obscured our ability to detect with confidence the snails' response and adaptation to microgravity. Two consequent missions used private aircraft directly from the nearest airport to Moscow, cutting the time to 10-14 hrs post-landing, and thus were more successful. Our story is based on the results of these two missions. Most of the data came from the last mission on the 30-day Bion-M1 satellite, where our space collaborators and we took into account the mistakes of the earlier missions.

First, we filmed the negative gravitaxis behavior of the ground control and postflight snails. A snail reacts decidedly when its head is directed downward along the vector of gravity such as an opposed head-down tilt, akin to us pitching face forward to the ground, and turns itself in the opposite direction. Then we analyzed the video records and measured the time parameters of the gravitaxis reaction, also the tentacle withdrawal reflex, which was a proxy for a defensive behavior to dangerous vestibular stimulus. In postflight snails, we found significantly shorter latency of the T0 phase of the reaction, simply the time when snails completely retract their tentacles, reflecting an interpreted characteristic of fear they feel. Significant differences between groups were also found in T0 and T4 phases for the length of the tentacles, but not for the angle between tentacles. We made correlation analyses of all measured parameters and found that snails that were slow in the first phases of gravitaxis response were slow in late phases as well. In addition, the correlation of duration of the phases and tentacles length in postflight snails is more correlated with the weight of the animal. The last finding is not surprising, since postflight snails for a month appeared not to feel the weight of their shells.



To translate the observed postflight behavioral characteristics of the snails with the underlying neural commands, we dug deeper into the vestibular sense organs of snails, the statocysts. This is paired organ, like the gravity-sensing otolith organs (utricle and saccule) we have. The equivalent angular acceleration sensors of the semicircular channels we possess are lacking in the snails. The statocyst contains an inertial mass of calcium carbonate grains or statoconia in the form of aragonite surrounded by mechanosensing hair cells and supporting cells. The number of hair cells in this snail species is only 13 cells, which are primary receptor neurons.

Vestibular adaptation to spaceflight can occur in the peripheral organ itself or in the neural connectivity or both. A popular hypothesis of vestibular changes occurring as the result of exposure to orbital flight, and often discussed in the literature, is an increase in inertial mass in an attempt to restore the "weight" of the statoliths. We used scanning electron microscopy in several postflight snail statocysts to compare with the superficial structure of two control statocysts and found no significant differences at this level of examination. This pointed more to plasticity associated with the sensory neurons

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At the 2013 timeframe of the Bion-M1 mission, new high-throughput sequencing techniques became available to researchers, and thus we attempted to study the transcriptomes of statocyst, which is challenging due to the small amount of RNA in this 13-cell organ and lack of genome data for this snail. Finally, we (with our collaborators) had success and found that different peptides are differentially expressed in postflight and control groups. For one of the more diverse neurotransmitter receptors, glutamate, we also found a significant difference between flight and their ground counterparts.

We then did physiological experiments in snail statocysts. We recorded the static nerve activity during tilts on postflight and control animals. Later we were able to make a detailed analysis of the records. In the static nerve, neural responses of statocyst are visible, and we were able to distinguish responses of one hair cell from the other by action potential or spike parameters.

In all three missions, the spontaneous or normal background activity of statocysts didn't change in postflight animals in comparison with control. The total response activity in the static nerve was significantly higher in the postflight group at some time points. In the two successful missions with different duration of exposure to near weightlessness, we conducted comparable protocols and concluded that the time of neural adaptation to microgravity is less than 12 days (the duration of the shorter mission). The postflight snails of Bion-M1 satellite were prepared for recording over a relatively long period of time, about 6 hours. If we split the postflight group into early and late recordings, the critical time point is 20h after landing, when we clearly see the readaptation of statocyst to normal gravity. We then reanalyzed our data from the previous mission, split the postflight snails of the Foton-M3 satellite, and found the same picture there. The earlier we recorded the neural statocyst activity to perturbation stimuli after landing, the greater were the responses. We made the same comparison on the level of single hair cells, sensitive to the preferred direction of the stimuli. We found an even more profound effect of increased responses on postflight statocysts than in total activity. A very similar critical time point of readaptation to normal gravity after landing was found in studies of vertebrate animals and human astronauts, suggesting a common neuronal basis of vestibular system adaptations.

Are some chitons extremophiles, or mere opportunists on the fringe of hostile deep-sea habitats?

Douglas J. Eernisse
California State University, Fullerton, USA
Email: deernisse@fullerton.edu

Eight chiton species were identified in samples from a methane seep off Costa Rica. They are already known from whale-falls, seamounts and other deep sea samples. Douglas J. Eernisse posed several questions (see Fig. 1). Some chiton species were large, reaching several centimetres in length (Fig. 3) . One of the species, *Placiphora velata*, is an ambush predator and behaves like a Venus Flytrap. Eernisse concluded that seep habitats provided opportunities for generalist deep sea species, though some of the genera are know to inhabit shallow seas; there is still much to learn about chitons.

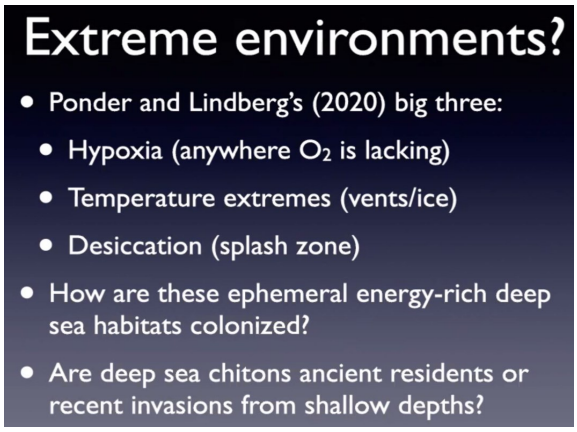


Figure 1

Figure 2

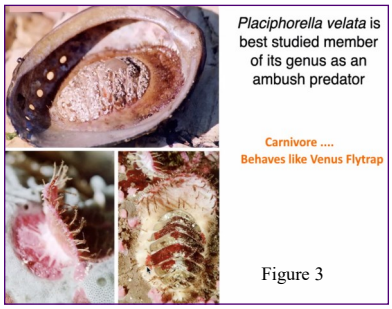


Figure 3

Solar radiation stress in terrestrial snails — from thermodynamics to microevolution

Heinz-R. Köhler, Institute of Evolution and Ecology, University of Tübingen, Germany

Heinz-R. Köhler [1], Rita Triebskorn [1], Ulrich Gärtner [2], Henri A. Thomassen [1], Yvan Capowiez [3], Christophe Mazzia [4], Thomas Knigge [5] and the 2018 Theba Survey Consortium [6]

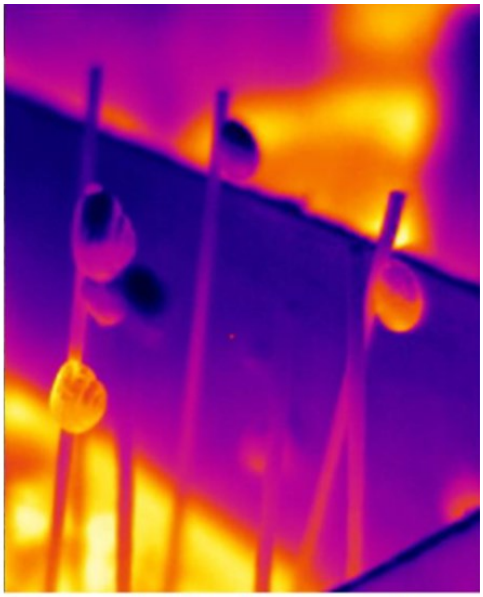
[1] Institute of Evolution and Ecology, University of Tübingen, Tübingen, Germany
[2] Faculty of Engineering, Esslingen University of Applied Sciences, Esslingen, Germany
[3] INRA, UMR 1114, Avignon, France
[4] IMBNE, UMR 7263, AMU, CNRS, Université d´Avignon, Avignon, France
[5] UMR-I 02 SEBIO, Université du Havre, Le Havre, France
[6] Z. Arad, T. Backeljau, J.K.Y. Burmester, Y. Capowiez, L.J. Chueca, M. Coelho da Silva, M.S. Davies, L. Favilli, J. Florit Gomila, J. Heller, T. Knigge, H.-R. Köhler, S. Krais, A. Lobo da Cunha, G. Manganelli, S. Mazzuca, T. Monsinjon, C. Moreira, G. Moreno-Rueda, A. Piro, T. Prieto, J. Quintana Cardona, E. Rolan-Alvarez, B. Rowson, M.J. Saffrey, L. Sawallich, M. Schilthuizen, H. Schmieg, A.E. Staikou, H.A. Thomassen, G. Tomás Faci, R. Triebskorn

Email: heinz-r.koehler@uni-tuebingen.de

Land snails, especially in Mediterranean and arid climates, are sometimes exposed to very strong solar radiation. Nevertheless, some species living in these habitats occur in exceptionally high individual densities, suggesting effective adaptations of these animals to heat and drought stress. In addition, these snails may include highly polymorphic species, in which individuals can differ considerably in the pigmentation of their shells. In this context, adaptation mechanisms on the biochemical, physiological, behavioural and morphological levels and their microevolutionary implications can be elucidated by a combination of laboratory, semi-field and field studies.

Our work concentrates on helicoid species, particularly on the highly polymorphic species *Theba pisana*. Using high-resolution thermography, µMRT, flow modelling, respirometry, biochemistry and field-based microcosms our team addresses the following questions: Under which conditions do land snails predominantly suffer from thermal stress and how can they limit it? Are different pimentation patterns actually biologically relevant in this context? Which conditions overstrain the capacity of biochemical and physiological defence mechanisms? Is there a thermal selection pressure on more intensely pigmented morphs and, if so, under which climatic conditions? And does this have implications for the future distribution of the species and phenotypic variation of *T. pisana* at the continental scale in the context of climate change?
In the year 2017, we installed 54 open-top chambers close to Avignon, Southern France, and investigated about 11,000 individuals of *T. pisana* (*Ecology & Evolution* **11**: 1111-1130 [2021]). In 2018, we conducted a Europe- and Middle East-wide survey, which brought together >30 colleagues providing more than 19,000 *T. pisana* individuals from 172 sites which we used for pigmentation analysis and spatial modelling of morphs. Our studies revealed the particular importance of climatic parameters for the evolution of morphological variation across the Mediterranean and all of Europe, and models allow predictions of the future continent-wide distribution of this species and its morphs as a result of expected environmental warming.

Open-top chambers on the INRA campus, Avignon.



Thermal imaging of *T. pisana* escaping from the hot soil.

Quickfire presentations—

These were the MSL's solution to the problem of not being able to have a poster exhibition. Each on-line presentation was for 5 minutes. If no abstract is here, no abstract was made available. Images are screen grabs from the talks, or were supplied by the presenters.

Victor Kang

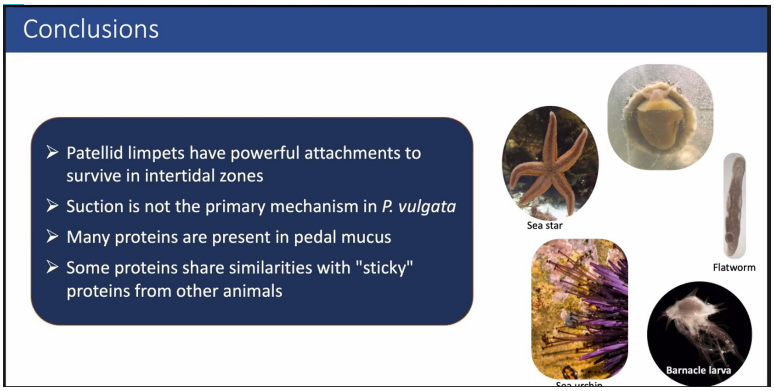
Postdoctoral researcher
Evolutionary biomechanics group
Department of Bioengineering,
Imperial College, London
k.kang@imperial.ac.uk>

Patella vulgata **adhere with such strength that an individual can easily withstand the weight of a large rock.**

A method was devised in this study to collect limpets with minimal damage to their soft bodies. Here the attachment organ - the pedal sole - is shown on a recently detached specimen, where several unfortunate barnacles were also detached in the process.

Limpet feeding on algae growing on the shell of its neighbour

A rare sighting of a limpet actively moving. Unlike barnacles and mussels, which remain permanently attached as adults, limpets often move around to feed. This specimen was photographed mid-transition from a glass plate to the aquarium



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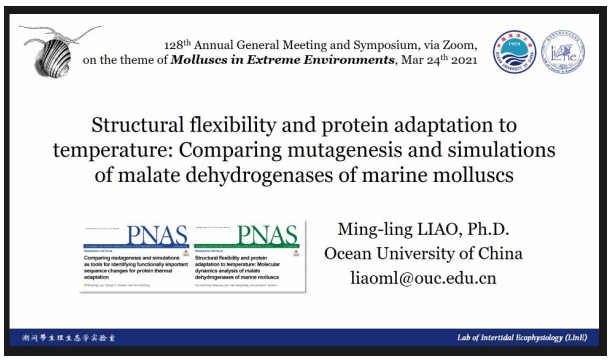

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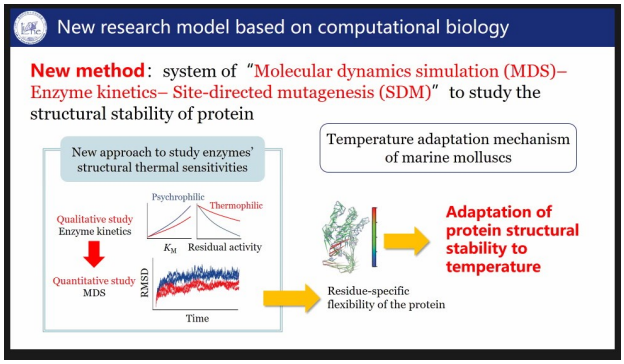

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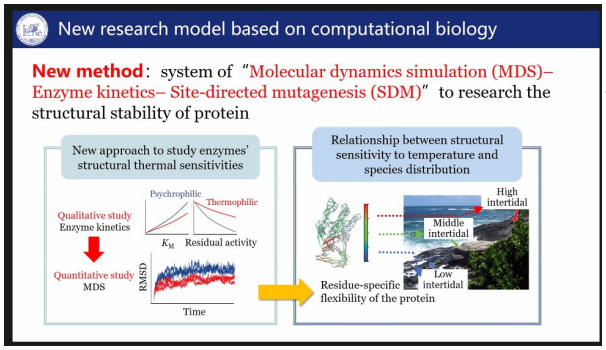

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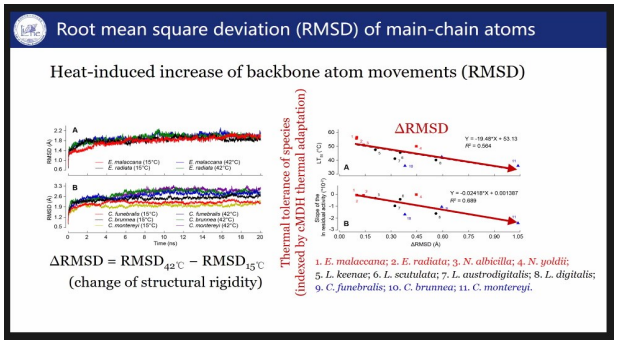

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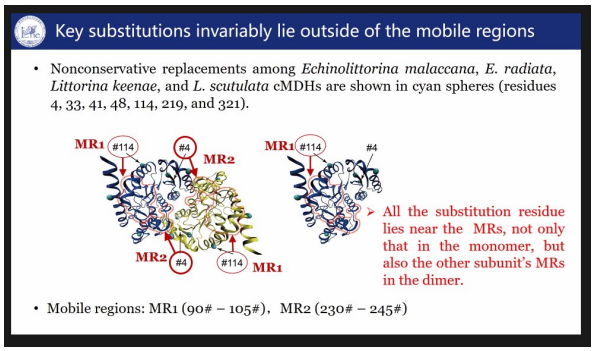

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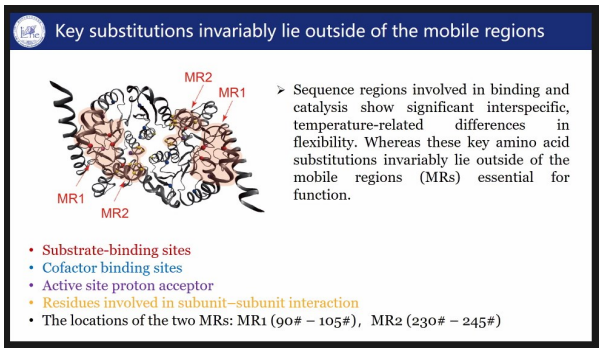

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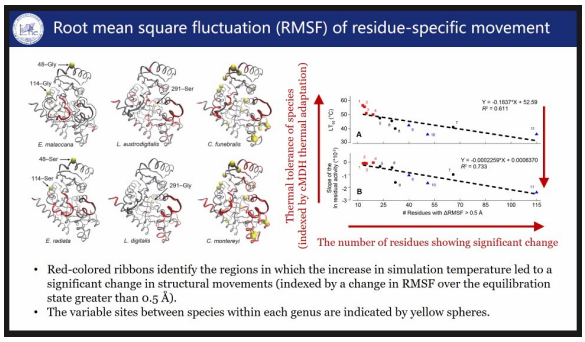

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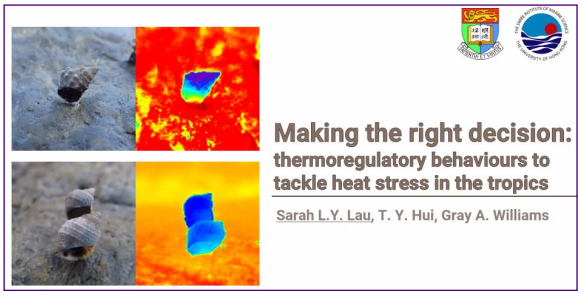

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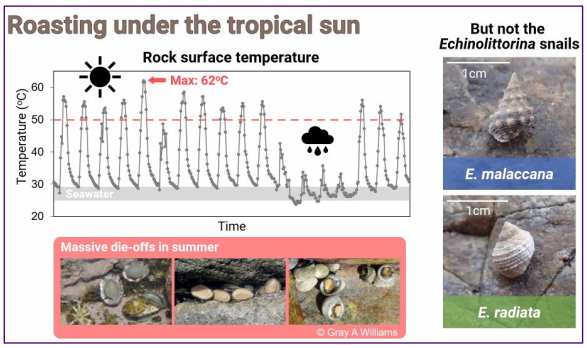

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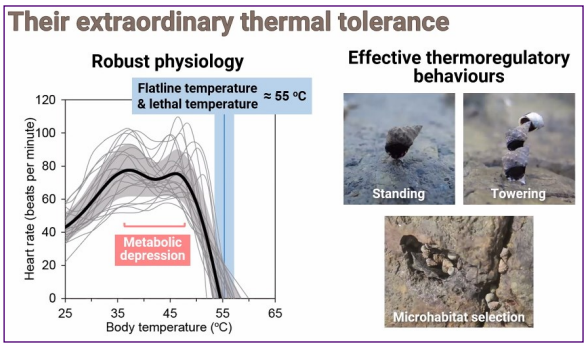

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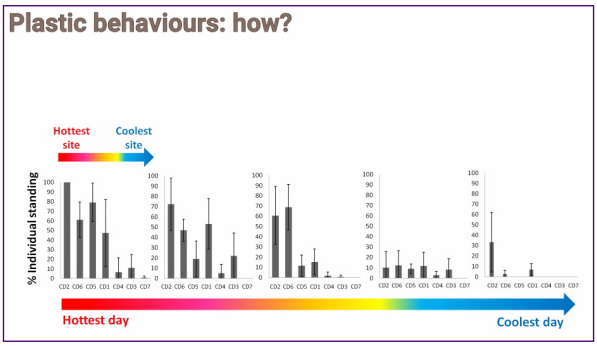

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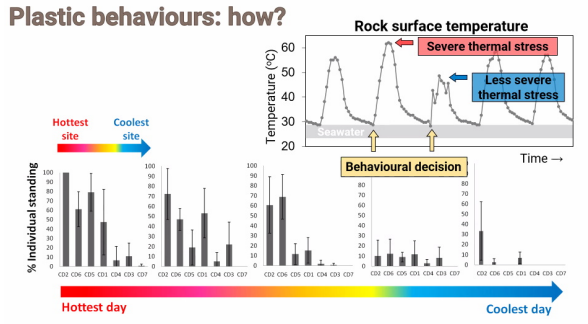

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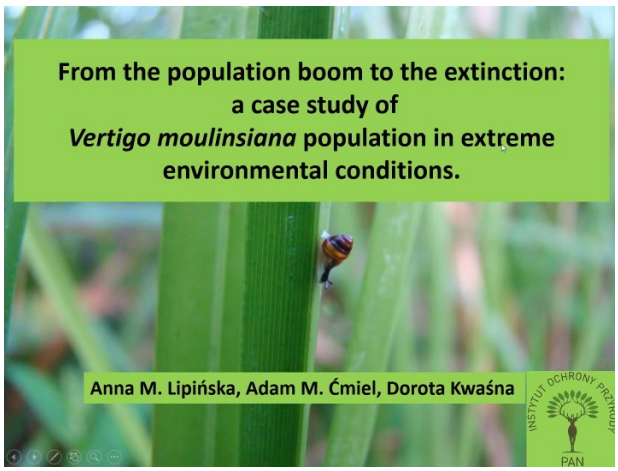
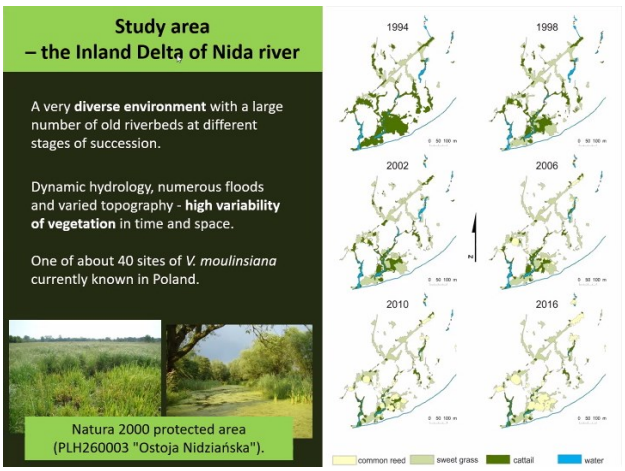
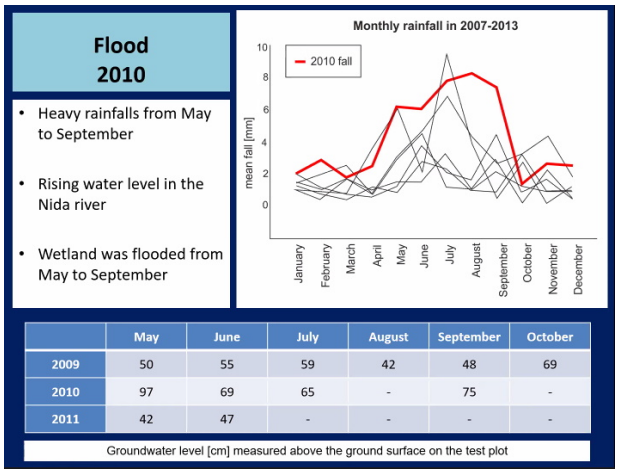
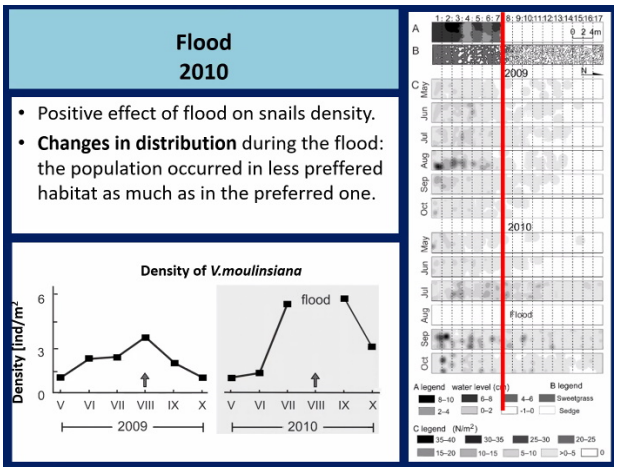


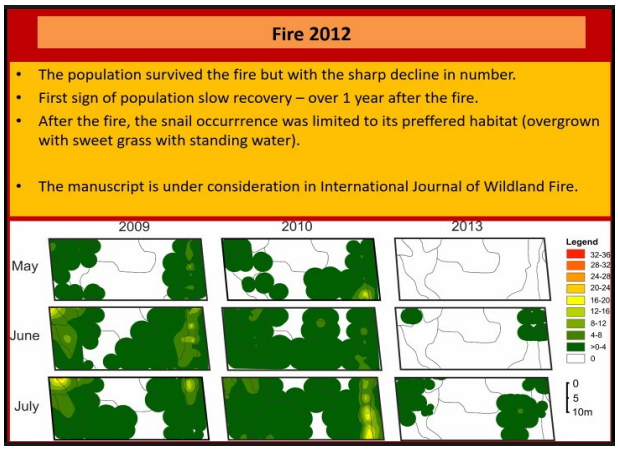


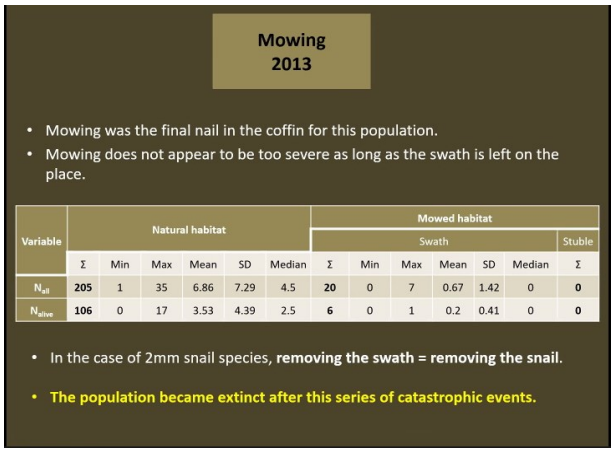


	May	June	July	August	September	October
2009	50	55	59	42	48	69
2010	97	69	65	-	75	-
2011	42	47	-	-	-	-

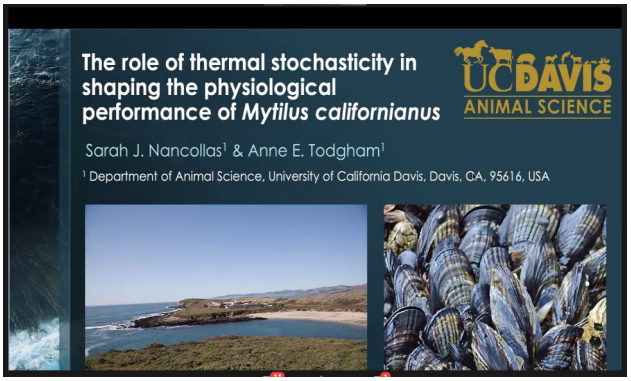
Groundwater level [cm] measured above the ground surface on the test plot







Variable	Natural habitat						Mowed habitat						
							Swath						Stuble
	Σ	Min	Max	Mean	SD	Median	Σ	Min	Max	Mean	SD	Median	Σ
N_{all}	205	1	35	6.86	7.29	4.5	20	0	7	0.67	1.42	0	0
N_{alive}	106	0	17	3.53	4.39	2.5	6	0	1	0.2	0.41	0	0



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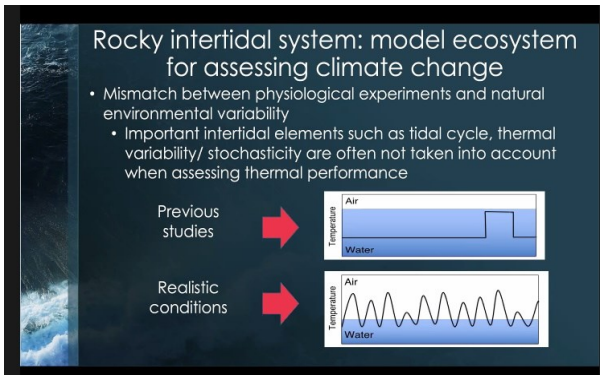

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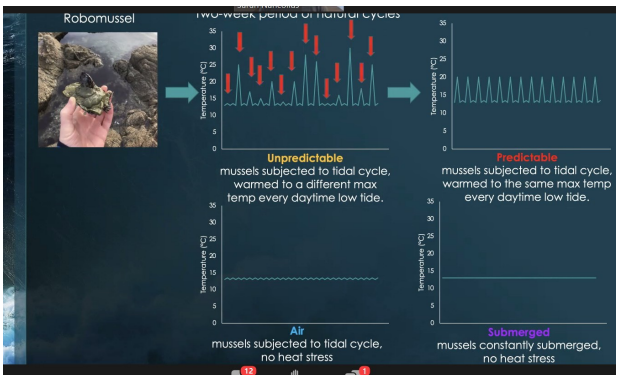

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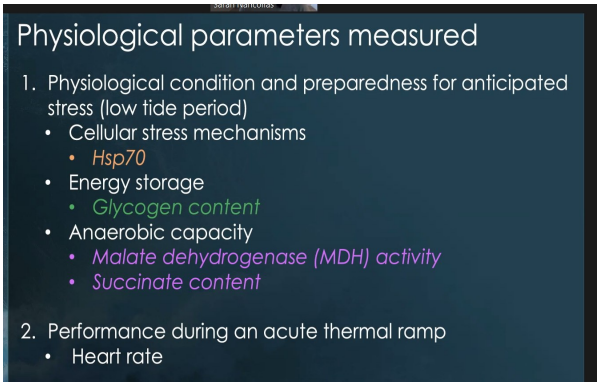

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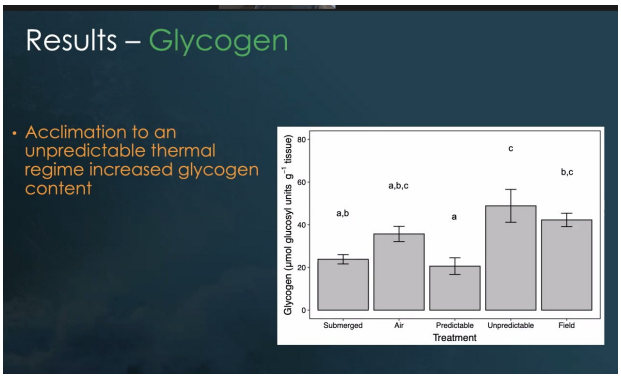

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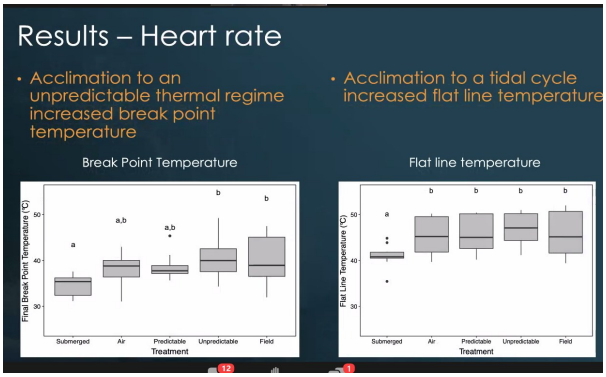

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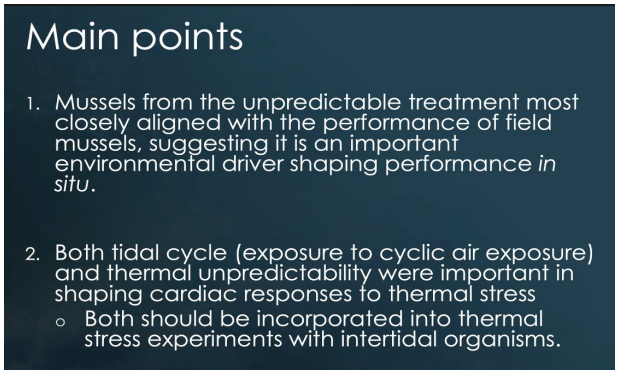

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1

Exploring the symbiotic relationship that underpins the success of a hydrothermal-vent gastropod

Elin Thomas
Queen's University Belfast
Molluscs in Extreme Environments Symposium

2

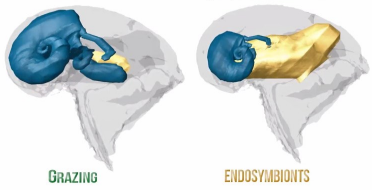
Background: *Gigantopelta chessoia*

- Peltospirid gastropod
- Endemic to hydrothermal vents
- 2 vent sites on East Scotia Ridge in Southern Ocean

3

Background: *Gigantopelta chessoia*

- Cryptometamorphosis
- Hosts bacterial endosymbionts in specialized organ – trophosome
- "Giant" – up to 45 mm!



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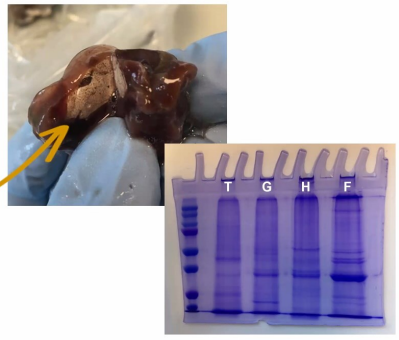
Aim:

- Study the protein expression of the *G. chessoia* holobiont
- Proteomics – the characterisation and quantification of proteins

5

Protein extraction:

- Proteins extracted from 4 different tissue types:
  - Trophosome
  - Gill
  - Heart
  - Foot



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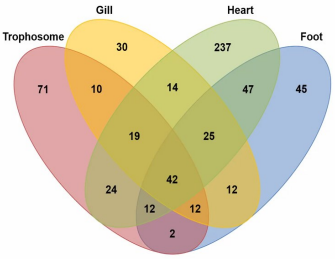
Preliminary results:

- 602 unique proteins identified in total across all 4 tissue types
- Many shared across different tissue types
- 71 proteins unique to trophosome



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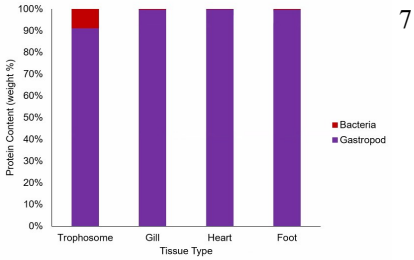
Preliminary results:

- Bacterial proteins account for ~ 9% of the trophosome's total protein content
- Bacterial proteins absent from all other tissues



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Preliminary results:

- Highly abundant protein families identified so far
- Several proteins involved in metal ion binding
- Identified protein groups that are important under stress conditions

Filamin	Peptidase M17	Enolase	Protein disulfide isomerase
Chaperonin (HSP60)	Myosin	Alpha-actinin	Paramyosin
Intermediate filament	Tropomyosin	Actin	Calponin
ATPase alpha/beta chains	Spectrin	Heat shock protein 70	Tubulin
Calmodulin	14-3-3	Rab	Histone H4

9

Impact:

- New insights into molecular interactions and evolutionary processes in hydrothermal vent holobionts
- Improve understanding of complex relationships that underpin the success of molluscs in extreme environments

Acknowledgements:
Mark Shepherd, Prof. Julia Sigwart, Prof. Geoff McMullan, Dr Bobby Graham

Obituaries

Brian Morton
1942 - 2021

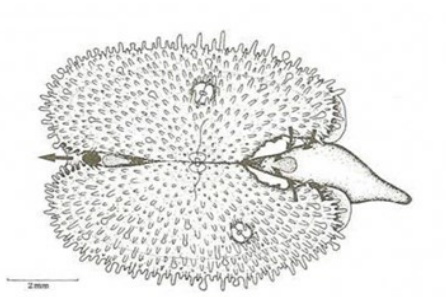
Brian Morton, malacologist, marine biologist and marine conservationist died on March 28 2021 at Littlehampton, England.28th March, 2021.

The contribution that Brian made to our knowledge of the anatomy and ecology of bivalves was profound. Over his career he investigated bivalves from a huge spectrum of families, employing meticulous dissection coupled with serial thin sections. Throughout he was notable for use of ink drawings of shells, gross anatomy and microscopic structures seen in thin section with only rare use of photographic images. These studies followed and developed from the tradition of functional morphology established by Sir Maurice Yonge in previous decades.

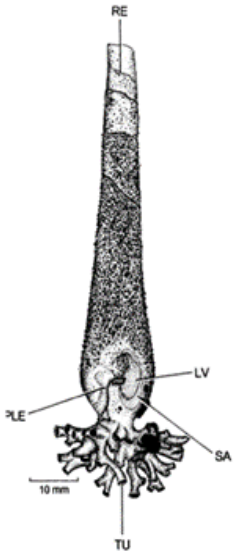
His bivalve investigations began with his PhD (1968) study of the biology of the invasive *Dreissena polymorpha* in a west London reservoir (his PhD supervisor Richard Purchon was, in turn, a former student of Yonge). Interest in dreissenid bivalves later came back into prominence following invasion of *Dreissena* into the American Great Lakes, the spread of *Mytilopsis* around the world and the discovery of a cave-living *Congeria* in Croatia; Brian was involved in all these studies. Similarly, earlier research into *Corbicula fluminea* in Hong Kong became globally relevant with the spread into numerous freshwater systems. Together with Joseph Britton, Brian published the definitive practical guide to the study of *Corbicula*.

Brian was always fascinated by bivalves at the extremes of morphology or ecology. This led to his studies of the anatomy and ecology of coral-boring bivalves in the families Lithophaginae and Gastrochaenidae and also mangrove mud-living bivalves such as *Geloina* and *Laternula*. A long-term interest was in the anatomy and commensal associations of galeommatoidean bivalves with burrowing invertebrates, such as sipunculans, echiuroids and crustaceans.

Another focus was the Anomalodesmata, for a while recognised as a distinct sub-class of Bivalvia although molecular results now confirm the group is part of the radiation of heterodont bivalves. They exhibit a range of life styles but the clade of Cuspidariidae, Verticordiidae and Poromyidae lack normal gills and have adopted a predatory, carnivorous diet, feeding suctorialy on small crustaceans. Over the years, Brian described the anatomy and possible food capture mechanisms of a range of these unusual bivalves (most recently with Fabrizio Machado) that live mainly in deeper water. The most bizarre anomalodesmatan bivalves belong in the superfamily Clavagelloidea most notably the tubular 'watering pot' shells *Brechites*, *Nipponoclava* and *Verpa* with the flared, perforated anterior ends resembling the rose on garden watering cans while the true shells are embedded into the wall of the tube. Brian investigated their anatomy and hypothesized about the mode of tube formation. Other clavagelloideans include forms that excavate crypts in limestone and coral and have short funnel shape tubes. Brian rarely found these genera alive but his persistent search of museum collections and rare finds resulted in evolutionary scenarios and a proposed separation into two distinct families Clavagellidae and Penicillidae. These studies culminating in a recent comprehensive review (with F. Machado) of their origin, relationships and evolution.



Galeomma taki **(from Morton, 1973)**



Stirpulina ramosa **(from Morton 2007)**

Brian had a long-term interest in the eyes of bivalves, beginning with the siphonal eyes of *Laternula* and continued with descriptions of the structure and distribution of various types of pallial and cephalic eyes in a wide range of species. Major review papers discussed their evolution and phylogenetic distribution.

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The ecological importance of Mytilidae in rocky shore communities of Hong Kong led Brian with many students to long term studies of all aspects of the biology of intertidal mussels particularly *Perna*, *Mytilisepta*, *Septifer* and *Brachidontes*.. Most recently, collaborative molecular studies of Mytilidae have clarified disputed relationships of some species.

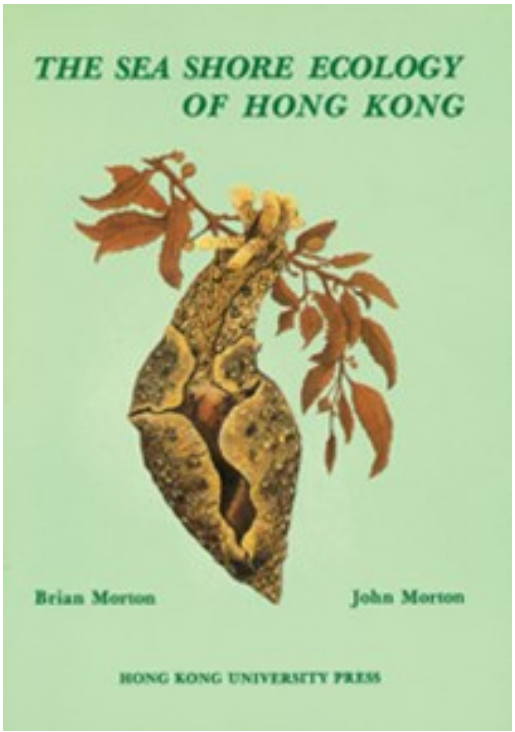
Following his BSc and PhD at Chelsea College, University of London, Brian worked briefly on shipworms at the Hayling Island Laboratory of University of Portsmouth before moving to the Zoology Department at Hong Kong University in 1971 where he stayed until retirement. It is fair to say that in 1971 HKU was a backwater of marine biology but by the time of Brian's retirement and led by his efforts it had been transformed into a powerful and influential centre in Asia. Along with the many students that were trained and went on to prominent positions in marine biology or environmental agencies in Hong Kong or abroad, his most notable achievement was the construction and opening in 1990 of the Swire Institute of Marine Sciences at Cape d'Aguilar where he was Director for 13 years. The laboratory has acted as a major focus for marine research ever since.

Brian collecting 1986 Marine Biological Workshop, Hong Kong

Soon after arriving in Hong Kong Brian realised that on these diverse shores there was a severe taxonomic impediment that hampered research. In order to address this problem, he organised a series of residential malacological and marine biological workshops and invited experts in various animal groups from around the world to visit Hong Kong and conduct field-based research at a youth centre near Tolo Channel in the New Territories. The workshops increased in size and became logistically complex with organised shore work, vehicles, boats, dive groups, trawling and dredging coupled with improvised laboratories. These workshops were amazingly effective with the results published in a series of voluminous proceedings from 1979 –1989. Some of the locations, habitats and their biota documented by the early workshops

have now disappeared or impacted by increasing urbanisation and the publications stand as a valuable data archive. Many participants returned regularly to Hong Kong to continue research. Later, three smaller-scale workshops were based at the Cape d'Aguilar laboratory.

A milestone in marine ecology of Hong Kong was the book 'The Seashore Ecology of Hong Kong' (1983) written by Brian and co-author John Morton (from New Zealand and no relation). All the major habitats were described and the constituent flora and fauna illustrated largely by composite line drawings. Better than dry academic research papers this book proved to be major stimulus to education and public awareness of the marine habitats of Hong Kong. Other books on seashore ecology written and illustrated in similar style followed featuring the Azores and Gulf of Mexico. A lifelong connection to the Azores with repeated research visits began in 1965 with an undergraduate expedition from Chelsea College. There Brian first met and became friends with Antonio Frias Martins (then a trainee priest) who later became a zoologist and they collaborated on the book 'Coastal ecology of the Azores' (1998). Another book 'Shore ecology of the Gulf of Mexico' (1989) resulted from a long-term research collaboration and friendship with Joseph Britton then of Texas Christian University.



In the 1970s the marine environment of Hong Kong was severely impacted by pollution and habitat destruction from increasing urbanisation. Soon after arriving Brian became a passionate, vociferous and outspoken advocate for the formation of marine reserves and controls of the marine disposal of industrial and domestic effluent. Change came slowly but in the end persistence paid off with the establishment of a series of marine parks and reserves including the corals at the Hoi Ha Marine Park and the Cape d'Aguilar reserve. The first and major success was the World Heritage site of the Mai Po wetlands administered by the World Wildlife Fund.

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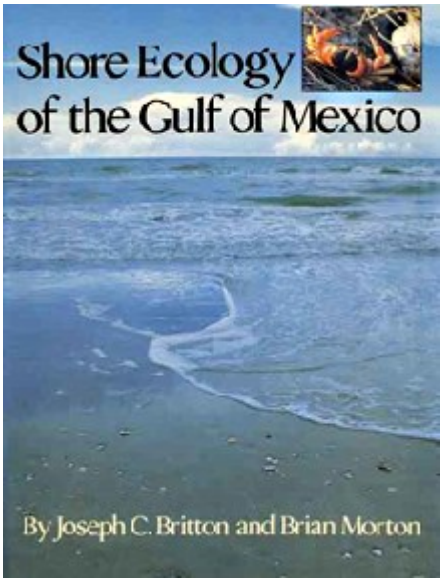
By any standards his research output in terms of publications was enormous and sustained by prodigous drive and determination throughout all his career. In retirement in 2003 and back at Littlehampton the stream of papers, books and articles continued and he was still completing papers in the last weeks of his life. For all the many achievements his constant need to keep proving himself or outdoing perceived competitors either within his own institute or more broadly was at times challenging for friends and colleagues. Although often scathing in criticism of the work of others he could be belligerent when his own work was challenged. Some of us remember Friday evening consumption of alarming quantities of beer in the Senior Common Room at Hong Kong University which brought out both the best and worst in a generous, talented and complex man.

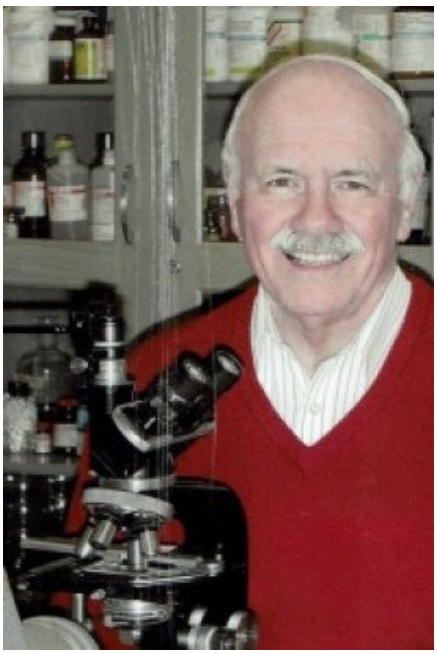
Brian received many awards for his conservation work including election to the Global 500 by UNEP, investiture as Knight of the Golden Ark, Netherland (1997), Order of the British Empire (1999) and the Duke of Edinburgh Conservation Gold Medal (2004). He was a long-term supporter of the Malacological Society and elected as Honorary Life Member.

John Taylor (with input from Emily Glover and Liz Harper)



In English pub 2015
Published by Mackie

John B. ("Jack") Burch
1929 - 2021



I am deeply saddened to inform you that our esteemed colleague John B. ("Jack") Burch died yesterday at the age of 92 after a long illness. He had been very well taken care of by his family and passed away peacefully in their company in Littleton, Colorado. His devoted partner of 69 years, Peggy Burch (pegburch@umich.edu), informed me that a family memorial or Celebration of Life may be held at a later date (we are still in the middle of a pandemic) and that, in lieu of flowers, donations in his memory be made to The John B. Burch Malacology Fund, or to a charity of your choice.

Jack had an extraordinary, long-lived, and highly influential career in science serving as Professor and Curator of Molluscs at the University of Michigan since 1962 (*Emeritus* since 2001). See below an outline of some of the highlights, and his *Curriculum Vitae* for details.

Honors & Awards

Honorary Life Memberships: American Malacological Society (2009), Malacological Society of Korea (1994), Malacological Society of the Philippines, (1994).
Lifetime Achievement Award: The Freshwater Mollusc Conservation Society (1999).
Special Recognition Award: The Science Society of Thailand (1995).

Research Interests

Jack had broad interests in the biology of non-marine Mollusca, especially freshwater snails, and he made numerous significant contributions to their global study. Early in his career, a major focus was the application of karyological, serological, and tissue culture techniques to characterize the roles of intermediate snail hosts in the epidemiology of human schistosome parasites. This involved extensive field work throughout the tropics and lab work in Ann Arbor (below, left). One of his major immuno-cytological discoveries was the presence of cryptic diploid and polyploid (tetra/hexa/octoploid) lineages in populations of the important intermediate host *Bulinus truncates/tropicus* complex, that were differentially susceptible to infection by human schistosome parasites. This seminal work led to years of research (supported by NIH, NSF, and the World Health Organization) and international outreach, the latter involving numerous workshops on medical malacology as well as the training of scientists from a large diversity of countries.

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In addition to his medical malacology research, Jack made many important basic science contributions to our fundamental knowledge of non-marine molluscan diversity in his >180 publications. He was also distinguished by his prodigious outreach and service to malacology as a discipline. One aspect of this was his exquisite guides to North American freshwater molluscs (*Freshwater Unionacean Clams of North America, Freshwater Sphaeriacean Clams of North America, North American freshwater snails*) and land snails (*Land Snails of The University of Michigan Biological Station Area, Identification of Eastern North American Land Snails, How to Know Eastern Land Snails*). Another was his astonishing record of founding four new malacological journals, one of which, *Malacologia* (currently the top-ranked Zoological journal by citation metrics), endures. The other three are now either transformed into a new entity (*Walkerana*, now *Freshwater Mollusc Biology and Conservation*), or, after decades of production (*Malacological Review*, *Journal of Medical and Applied Malacology*), retired.

Jack Burch in the 1960s

To paraphrase Shakespeare (*Othello*), Jack has "*done the state* (of Malacology) *some service, and they know't.* "
He will be missed.

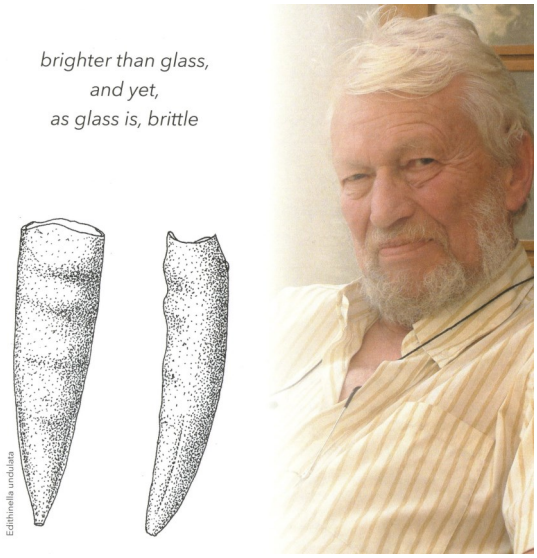
Diarmaid Ó Foighil
Museum of Zoology & Department of Ecology & Evolutionary Biology
The University of Michigan.

Editor's note -In an email conversation with Diarmaid about Jack Burch, I told him that in my younger days, I'd met Jack at conferences a few times and found him to be a gentlemanly, kind person. Diarmaid replied " Your interaction with Jack was highly characteristic. He was a warm and supportive personality who wore his scientific pre-eminence lightly and was invariably encouraging to younger scientists - that was also my experience. "

Arie W. Janssen

With great sadness we inform you that Arie W. Janssen, nestor of fossil and recent malacological research in the Netherlands, passed away in the night of 6th August 2021. He reached the age of 84 years and during the last few months suffered from a rapidly deteriorating physical condition; nonetheless until just a few days before his death he kept on working on pending publications with zeal and a bright mind as ever.

Arie was a self-taught researcher and had a long career as malacologist and palaeontologist that started at the Rotterdam Museum of Natural History in the mid nineteen sixties. From 1969 onwards he continued at the Rijksmuseum van Geologie en Mineralogie (the National Museum of Geology and Mineralogy) that is nowadays part of Naturalis Biodiversity Center in Leiden. As curator of the fossil mollusc collections he ensured major enlargements through fieldwork and through donations from the networks Arie had been building. The collections at the department of fossil mollusca rank among the top ones of their kind in the world. Arie's extensive field work and research during the first part of his career was focused on Tertiary and Quaternary molluscs mainly from the North Sea Basin, but also from other parts of Europe.



The front of Arie's funeral card, depicting a pteropod of the genus *Edithinella*. Arie described and named it after his wife Edith.It also shows his favourite definition of pteropoda, which he used in most of his messages and emails combined with his signature.

Since the mid nineteen eighties, Arie increasingly concentrated his research on fossil planktic gastropods (mostly pteropods and heteropods). He promoted and implemented the stratigraphic use of these groups of fossil molluscs, as they proved to be very useful to enable long-distance correlations and the establishment of stratigraphic ages of geological units. He developed into a specialist of worldwide renown in this field and personally contributed to what is today the world's largest planktic molluscan collection (fossil + recent), housed in Naturalis. Nowadays planktic gastropods are important indicators for the state of our oceans and their increasing acidity. Arie's research is being continued by the Naturalis Plankton Group under the leadership of Katja Peijnenburg.

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Arie was one of the co-founders of the WTKG, the Dutch Work Group of Tertiary and Quaternary Geology, a team of professional and above all non-professional enthusiasts. He built a widespread network that delivered important results in scientific 'grassroots' research of fossil molluscs, but also on local stratigraphy. Besides encouraging the members with his thorough knowledge and ability to enthuse people, Arie was also for many years the editor of the WTKG's scientific publications, that appeared from 1964 first under the name *Mededelingen* (Contributions) and from 2002 onwards under the name *Cainozoic Research*.

Arie leaves behind an enormous œuvre of more than 300 publications, smaller papers but also a considerable number of voluminous books. A highlight for the knowledge of Dutch Miocene molluscs was his 450-pages book with a 82-plates atlas on the fossil fauna of the Miste beds (near Winterswijk, The Netherlands) that appeared in 1984. But not only fossil molluscs caught his interest; in 1965 he wrote, together with the recently deceased Ed de Vogel, a book on Dutch freshwater molluscs. This early work found its updated continuation in the 1998 standard work *De Nederlandse Zoetwatermolluscen*, authored by a consortium of scientists with Arie's participation. But his most important scientific legacy are the many papers with groundbreaking research results on planktic molluscs. After his retirement in 1997, Arie and his wife Edith moved to Malta, where he intensified his research on fossil pteropods. They moved back to The Netherlands in 2013, where Arie continued his research work even up to the last days of his admirable and fruitful life.

His name will live on through no less than 32 eponyms, named in honour of his work by colleague scientists. Besides twenty-three new mollusc and five new fish species, four new mollusc genera bear his name. But above all his name Janssen will remain forever present, connected to no less than 175 molluscan species described by him as new to science, a stunning 115 of which in the Pteropoda and Heteropoda, plus one new family, one new subfamily, twelve new genera and two new subgenera.

He will be greatly missed by colleagues and worldwide co-reseachers. It is a great loss for his friends and to science, and above all to his wife, his son and his daughter and his four grandchildren.

Jaap van der Voort (close friend and independent reseacher, Ostercappeln, Germany),
with contributions from
Frank Wesselingh, Ronald Pouwer and Katja Peijnenburg (Naturalis Biodiversity Center, Leiden, The Netherlands)

LIST OF TAXA DESCRIBED
BY ARIE W. JANSSEN (INCLUDING with CO-AUTHORS) SORTED BY YEAR OF PUBLICATION, AND SHOWING THE TAXONOMY USED IN THE ORIGINAL PUBLICATION, IRRESPECTIVE OF POSSIBLE LATER EMENDATIONS. Newly described (sub)genera or (sub)families are shown in *CAPITALS*.

Solariella (Solariella) formosa Janssen, 1967
Skenea minuta Janssen, 1967
Daronia (?Cyclostremella) punctata Janssen, 1967
Circulus quadricarinatus Janssen, 1967
Cingula (Ceratia) regiorivi Janssen, 1967
Cingula (Chevallieria) pseudoproxima Janssen, 1967
PSEUDALVANIA gen.nov. Janssen, 1967
Pseudalvania dingdensis Janssen, 1967
Teinostoma (Solariorbis) hosiusi Janssen, 1967
Teinostoma (?Solariorbis) partimstriatum Janssen, 1967
Gegania miocenica Janssen, 1967
Cerithiopsis (Cerithiopsis) vogeli Janssen, 1967
Cerithiopsis (Cerithiopsis) vandermarki Janssen, 1967
Cerithiopsis (Cerithiopsis) andersoni Janssen, 1967
Cirsotrema (Opaliopsis) turbonillaeforme Janssen, 1967
Cirsotrema (?Opaliopsis) koeneni Janssen, 1967
Circulus praecedens gliberti Janssen, 1967
Putilla gottscheana westfalica Janssen, 1967
Aclis (Stilbe) neglecta Janssen, 1969
Polinices (Euspira) staringi Janssen, 1969
Phalium (Semicassis) bicoronatum belgicum Janssen, 1969
ldasola lignicola Janssen, 1969
Axinulus germanicus Janssen, 1969
Alvania (Actonia) basisulcata Janssen, 1969
Amaea (Undiscala) marialuisae Janssen, 1969
Turriscala (s.l.) straeleni germanica Janssen, 1969
Euspira edithae Janssen, 1969
Hinia (Tritonella) twistringensis Janssen, 1969
Cancellaria (Merica) contorta gelriana Janssen, 1969
Narona (Aneurystoma) canaliculata Janssen, 1969

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Microdrillia teretiaeformis Janssen, 1969
Aphanitoma ronaldi Janssen, 1969
Aphanitoma fransi Janssen, 1969
Conus (Chelyconus) altenai Janssen, 1969
Eulimella (Eulimella) lutaria Janssen, 1969
Ebala (Ebala) vandervlerki Janssen, 1969
Spiratella kautskyi Janssen, 1969
Astarte (Isocrassina) omalii scaldensis Janssen, 1974
Tridonta (Tridonta) domburgensis Janssen, 1974
Gyraulus (Gyraulus) acuticarinatus vleminckxae Janssen, 1980
Nystia (Nystia) glibertheinzeli Janssen, 1980
Pododesmus (Monia) anitae Janse & Janssen, 1983
Skenea schuermanni Janse & Janssen, 1983
Rissoella (Jeffreysiana) hesselinki Janse & Janssen, 1983
Hinia (Hinia) cimbrica (Ravn, 1907) *voorthuyseni* Janse & Janssen, 1983
Babylonella stemerdinki Janse & Janssen, 1983
Daphnella defectiva Janse & Janssen, 1983
MISTEIA gen.nov. Janssen, 1984
Trigonostoma (Misteia) mistense Janssen, 1984
Trigonostoma barnardi Janssen, 1984
Trigonostoma lindeni Janssen, 1984
Trigonostoma pouwi Janssen, 1984
Trigonostoma geslini josephinae Janssen, 1984
Sveltia gliberti Janssen, 1984
GLIBERTTURRICULA gen.nov. Cadée & Janssen, 1985
Glibertturricula vervoeneni Cadée & Janssen, 1985
Spirulirostra baetensi Janssen & Müller, 1985
CAPEDOPECTEN gen.nov. Dijkstra & Janssen, 1988*Clio gailae* Goedert & Janssen, 2020
VAGINELLINAE subfam.nov. Janssen 2020
Capedopecten anellus Dijkstra & Janssen, 1988
Limacina ingridae Janssen, 1989
Limacina irisae Janssen, 1989
Limacina jessyae Janssen, 1989
Limacina mariae Janssen, 1989
Linacina wilhelminae Janssen, 1989
'Creseis' berthae Janssen, 1989
Clio blinkae Janssen, 1989
Clio irenae Janssen, 1989
Clio jacobae Janssen, 1989
Clio pauli Janssen, 1989
SPOELIA gen.nov. Janssen, 1990
Spoelia torquayensis Janssen, 1990
Limacina curryi Janssen, 1990
Limacina lunata Janssen, 1990
Limacina tatei Janssen, 1990
Vaginella victoriae Janssen, 1990
Vaginella sannicola Janssen, 1990
Clio nielseni Janssen, 1990
Vaginella tricuspidata Zorn & Janssen. 1993
FREDENIA gen.nov. Cadée & Janssen, 1994
Streptodytion impiger Cadée & Janssen, 1994
Streptodyction schnetleri Cadée & Janssen, 1994.
Streptodyction twistringensis Cadée & Janssen, 1994
Streptolathyrus masculinus Cadée & Janssen, 1994
Streptolathyrus regularis Cadée & Janssen, 1994
Fusus dhondtae (nom.nov.) Cadée & Janssen, 1994
Gamopleura melitensis Rehfeld & Janssen, 1995
Cuvierina jagti Janssen, 1995
Ireneia marqueti Janssen, 1995
Ireneia nieulandei Janssen, 1995
Clio giulioi Janssen, 1995
DIACROLINIA gen.nov. Janssen, 1995
? Diacrolinia elioi Janssen, 1995
EDITHINELLA gen.nov. Janssen, 1995
SPHAEROCINIDAE fam.nov. Janssen & Maxwell, 1995

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Philine aquila van der Linden & Janssen, 1996
Edithinella curva Janssen, 1998
Diacrolinia larandaensis Janssen, 1999
STRIOLIMACINA nom.nov. Janssen, 1999
Clio lucai Janssen, 2000
Clio (Balantium) collina Janssen & Zorn, 2001
Brocchinia gerdae Janssen & Petit, 2003
CURRYLIMACINA (gen.nov.) Janssen, 2003
Heliconoides vanderweideni Janssen, 2004
Bowdenatheca miocenica Janssen, 2004
Clio (s.lat.) ghawdexensis Janssen, 2004
Edithinella bonaviai Janssen, 2004
BELLARDICLIO subg.nov. Janssen, 2004
Cavolinia landaui Janssen, 2004
Cavolinia vendryesiana f. *Pliomediterranea* Janssen, 2004
Cuvierina (Cuvierina) pacifica Janssen, 2005
URCEOLARIA subg.nov. Janssen, 2005
Cuvierina (Urceolaria) cancapae Janssen, 2005
Cuvierina (Urceolaria) curryi Janssen, 2005
Ireneia gracilis Janssen, 2005
JOHNJAGTIA gen.nov. Janssen, 2005
Vaginella basitrunctata Janssen, 2005
Edithinella doliarius Janssen, 2006
Urceolarica nom.nov. Janssen, 2006 (for *Urceolaria* Janssen, 2005)
Atlanta lingayanensis Janssen, 2007,
Atlanta richteri Janssen, 2007,
Atlanta seapyi Janssen, 2007,
Heliconoides sondaari Janssen, 2007,
Striolimacina andaensis Janssen, 2007,
Hyalocylis marginata Janssen, 2007,
Cavolinia baniensis Janssen, 2007,
Cavolinia perparvula Janssen, 2007,
Cavolinia shibatai Janssen, 2007,
Diacavolinia pristina Janssen, 2007,
Diacria italica Grecchi, 1982 f. *fissicostata* Janssen, 2007
Diacria microstriata Janssen, 2007,
Diacria paeninsula Janssen, 2007,
Diacria philippinensis Janssen, 2007
Sphaerocina convolvula Janssen, 2007
Heliconoides lillebaeltensis Janssen, Schnetler & Heilmann-Clausen, 2007
Heliconoides linneensis Janssen, 2008
HAMECONIA gen.nov. Janssen, 2008
Hameconia edmundi Janssen, 2008
Heliconoides daguini Cahuzac & Janssen, 2010,
Heliconoides merlei Cahuzac & Janssen, 2010,
Heliconoides pyrenaica Cahuzac & Janssen, 2010
Limacina? *vegrandis* Cahuzac & Janssen, 2010
Creseis antoni Cahuzac & Janssen, 2010
Vaginella gaasensis Cahuzac & Janssen, 2010
Clio lozoueti Cahuzac & Janssen, 2010
Clio vasconiensis Cahuzac & Janssen, 2010
Diacrolinia cluzaudi Cahuzac & Janssen, 2010,
Creseis roesti Cahuzac & Janssen, 2010
Heliconoides mermuysi Cahuzac & Janssen, 2010
Creseis tugurii Cahuzac & Janssen, 2010
Peracle charlotteae Janssen & Little, 2010
Limacina erasmiana Janssen, 2010
Limacina guersi Janssen, 2010
Gamopleura maxwelli Grebneff, Janssen & Lee, 2011
Limacina asiatica Janssen, King & Steurbaut, 2011
Limacina dzheroiensis Janssen, King & Steurbaut, 2011
Clio (Clio) pyramidata Linne, 1767 f. *tyrrhenica* A.W. Janssen, 2012
Protatlanta kbiraensis Janssen, 2012
Carinaria maempeli Janssen, 2012
Heliconoides wardijaensis Janssen, 2012
Limacina ernstkittli Janssen, 2012
Creseis curta Janssen, 2012

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Styliola schembriorum Janssen, 2012
Johnjagtia baharensis Janssen, 2012
Clio merijni Janssen, 2012
Clio vilis Janssen, 2012
Cavolinia gatti Janssen, 2012
Cavolinia microbesitas Janssen, 2012
Diacrolinia pumilionis Janssen, 2012
Gamopleura pilula Janssen, 2012
Peracle amberae Janssen, 2012
Peracle grebneffi Janssen, 2012
Clione? ignotus Janssen, 2012
Clione? imdinaensis Janssen, 2012
Clione? phosphoritus Janssen, 2012
Clione? tripartitus Janssen, 2012
Clione? tumidulus Janssen, 2012
Heliconoides vonhachti Janssen, 2012
Tibiella watupuruensis Janssen, Renema & Wesselingh, 2013
Altaspiratella tavianii Janssen, Jagt, Yazdi, Bahrami & Sadri, 2013
Limacina aryanaensis Janssen, Jagt, Yazdi, Bahrami & Sadri, 2013
Limacina perforata Janssen, Jagt, Yazdi, Bahrami & Sadri, 2013
Limacina yazdii Janssen, Jagt, Yazdi, Bahrami & Sadri, 2013
Texacuvierina hodgkinsoni Janssen, Jagt, Yazdi, Bahrami & Sadri, 2013
ZHGENTIANA gen.nov. A.W.Janssen, R.Janssen & van der Voort, 2015
Cuvierina tsudai Burridge, Janssen & Peijnenburg, 2016
Limacina novacaesarea Janssen & Sessa, 2016
Limacina tanzaniaensis Janssen, 2017
Heliconoides nikkieae Janssen, 2017
Limacina timi Janssen, 2017
Limacina parvabrazensis Garvie & Janssen, 2020
Limacina pseudopygmaea Garvie & Janssen, 2020

Adhesive defence mucus secretions in the red triangle slug (*Triboniophorus graeffei*) can incapacitate adult frogs

Gastropods secrete mucus for a variety of purposes, including locomotion, reproduction, adhesion to surfaces, and lubrication. A less commonly known function of mucus secretion in this group involves its use as a defence against predation. Among the terrestrial slugs, mucus that serves this particular purpose has been studied for only a handful of species under laboratory conditions, where it is thought to be produced for self-fouling or to make individuals difficult to consume. However, the mechanisms of how these defensive secretions operate and their effectiveness in deterring predation in the natural world have not be described in much detail. Adhesive mucus secretions in the red triangle slug (*Triboniophorus graeffei*) may be an adaptation against predation. Field observations of a large redeyed green tree frog (*Litoria chloris*) trapped in the mucus secretions of a nearby *T. graeffei* revealed that this mucus serves to incapacitate predators rather than just simply as an overall deterrence. Mechanical stimulation of *T. graeffei* under laboratory conditions revealed that adhesive secretions were produced from discrete sections of the dorsal surface when disturbed, leading to the production of a highly sticky and elastic mucus that was unlike the thin and slippery mucus used during locomotion. The adhesiveness of the defensive secretions was strengthened and reactivated when in contact with water. This appears to not only be the first description of defensive mucus production in this slug species but one of the first natural observations of the use of adhesive defence secretions to incapacitate a predator. The biomechanical properties of this mucus and its ability to maintain and strengthen its hold under wet conditions make it potentially useful in the development of new adhesive materials.

Gould, J., Valdez, J.W. & Upton, R.
email: jose.valdez@bios.au.dk

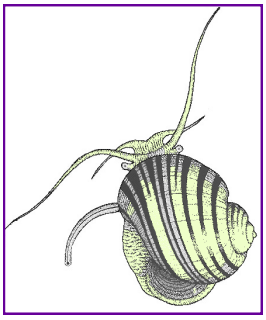
bioRxiv preprint doi: https://doi.org/10.1101/544775

Forthcoming meetings

The Malacological Society of London

HTTP://WWW.MALACSOC.ORG.UK

The Molluscan Forum



Thursday 18th November 2021
0945h – 1630h (to be confirmed)

CALL FOR REGISTRATIONS AND PAPERS
DEADLINE 16 OCTOBER 2021

This informal, annual, and successful meeting is designed to bring together people starting their research on molluscs, to give them the opportunity to present and discuss their work and to compare notes on methods and problems. The deadline for registrations and talk applications is

Attendance to the Molluscan Forum is open to all, but preference is given to **research students, post-post-doctoral researchers, undergraduate students starting molluscan projects, and amateurs** engaged in substantial projects that have not yet been published. Any topic related to molluscs is acceptable: palaeontological, physiological, behavioural, ecological, systematic, morphological, cellular, or molecular.

Short talks (~15 mins) or quick fire talks (3 slides, 5 mins, in lieu of posters) may be offered. They need not be polished accounts of completed work; descriptions of new methods, work in progress, and appeals for assistance with unsolved problems are equally acceptable.

THERE IS NO REGISTRATION FEE.

Enquiries and registrations to:
Phil Hollyman, Fisheries Ecologist, British Antarctic Survey (phyman@bas.ac.uk)

Non-presenters: please let us know you will be coming so that we can estimate numbers.

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The Malacological Society of London

Molluscan Forum, Thursday 18th November 2021
9:45 am – 4.30 pm

REGISTRATION FORM

Return before 1st October 2021, by email to:

Phil Hollyman, Fisheries Ecologist, British Antarctic Survey (phyman@bas.ac.uk)

Name……

Address……

……

Tel. No……

Email……

Status: Research Student / Undergraduate / Post-doctoral researcher / amateur (delete as appropriate)

'Other' (please state) ……..

Short talks (~15 min) or posters may be offered.
Instead of posters, we will have 5 minute (3 slide maximum) quick-fire powerpoint presentations,

I wish to give a talk / quick-fire talk (delete as appropriate) entitled:

……

……..

Please attach, as a Microsoft Word attachment, an abstract of not more than 350 words, TOGETHER WITH TWO .JPG IMAGES IN SUPPORT OF THE ABSTRACT. Abstracts and images of accepted contributions will be published in the Society's on-line bulletin which is called *The Malacologist. The Malacologist* has an ISSN number and is published and archived on the website of the MSL.

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Abstract submission

Abstracts submitted for the Molluscan Forum should be sent as Microsoft Word files.

Please use the following format:

Title (12pt, left justified)
<blank line>
Authors (10 pt, left justified, presenting author underlined; use superscript numbers to indicate institutional affiliation)
<blank line>
Institutions (10pt, left justified; in this order: Number (superscript), Department, Institution, City, Country)
Presenting Author email
<blank line>
Abstract (11pt, no indentation, left justified, 350 words maximum)

EXAMPLE ABSTRACT

The geographic scale of speciation in *Stramonita* (Neogastropoda: Muricidae)

Martine Claremont[1,2], Suzanne T. Williams[1], Timothy G. Barraclough[2], and David G. Reid[1]

[1]Deptartment of Zoology, Natural History Museum, London, UK
[2]Department of Biology, Imperial College London, Berkshire, UK
Email: m.claremont@nhm.ac.uk

Stramonita is a relatively small, well-defined genus of muricid marine gastropods limited to the tropical Eastern Pacific and the Atlantic. The type species, *S. haemastoma*, is known to have teleplanic larvae and is estimated to remain in the water column for several weeks. *Stramonita haemastoma* shows regional variation, and this has led to the recognition of five geographical subspecies: *S. h. haemastoma*, from the Mediterranean and Eastern Atlantic to Brazil, *S. h. floridiana*, on the east coast of Florida and in the Eastern Caribbean, *S. h. caniculata* on the west coast of Florida and the Gulf of Mexico, *S. h. rustica* in the Western Caribbean and *S. h. biserialis* in the Eastern Pacific. The protoconch has been shown to be similar across the *S. haemastoma* complex, implying that all subspecies have equally long lived larvae. Within these subspecies, cryptic variation is suspected. For example, *S. h. biserialis* is suggested to be differentiated North/South on a small scale. In the presence of teleplanic larvae, speciation on such a small scale seems paradoxical. Various explanations for this paradox are possible. Actual (or realized) dispersal of *Stramonita* species may be more limited than presently believed, leading to allopatric differentiation. Alternatively, morphological differentiation may not be a reliable indicator of genetic differentiation, and *S. haemastoma* (*sensu lato*) might indeed prove to be a single taxon. It is also possible that ecological speciation could result in geographical speciation on a small scale in the presence of wide dispersal. My results suggest that five species of *Stramonita* are present in the Caribbean, at least three of which occur sympatrically. Gene flow is maintained between Caribbean and Mediterranean populations in at least one species, while no genetic differentiation was found along the Eastern Pacific coast. The implications of these results are discussed.

NOTE THAT ABSTRACTS ARE PUBLISHED IN *THE MALACOLOGIST* WHICH IS THE BULLETIN OF THE SOCIETY AND HAS AN ISSN NUMBER.

BEFORE THE FORUM, PLEASE EMAIL TO THE EDITOR OF *THE MALACOLOGIST* (Email address below) TWO IMAGES TO ACCOMPANY YOUR ABSTRACT. TRY TO MAKE THESE IMAGES ONES THAT YOU WOULD NOT USE IN AN EVENTUAL FULL PAPER.

EDITOR georges.dussart@canterbury.ac.uk

Malacological Society of London Awards and Grants

The Research Awards Scheme was established to commemorate the Society's Centenary in 1993. Under this scheme, the Society gives awards to support research on molluscs that is likely to lead to publication. The closing date for applications each year is 15th December. Grants are preferentially conferred on students and researchers without regard to nationality or membership of the Society. Preference is also given to discrete research projects that fall within the subject areas covered by the Society's *Journal of Molluscan Studies*. Applications will be assessed by scientific merit, value of the project and for student applicants, the extent to which the research will benefit the applicant's scientific aspirations. The successful applicants will be notified by 31st March and announced at the Annual General Meeting. Awardees are encouraged to publish their work in the *Journal of Molluscan Studies* (full papers) or *The Malacologist* (travel award reports, research award reports, news of ongoing research etc) as appropriate,

Early Career Research grants

Eligibility is restricted to those investigators at the outset of their independent scientific career. Applications must therefore be 1) postgraduate students, 2) within five years of being awarded their PhD (adjustable for career breaks), or 3) independent researchers not having a PhD. Early Career Research Grants will only be awarded to individuals twice, but not within 3 years of receiving a first award

Sir Charles Maurice Yonge Award

There is no application process for Sir Charles Maurice Yonge Awards. These awards are given for the best Travel Award application on bivalves, by a member of the Society to attend an international meeting (not including the Molluscan Forum). Authors of exceptional studies on bivalves in *the Journal of Molluscan Studies* may on occasion also be given this award. The Editor will nominate such papers as he/she sees fit. The award covers the costs requested in a Travel Award, or for open access publication of the paper. Members of the Society will also receive a personal cash prize of £300. Non-members will receive a personal cash prize of £250 plus one year's membership to the Society. If a paper is multi-authored, the award will be made to the corresponding author.

Senior Research Awards

are aimed at established researchers in professional positions, but without regard to nationality. Applicants for Senior Research Awards must be members of the Malacological Society of London. The Society currently awards up to five Senior Research Grants per year, each with a value of up to £1,500, to support research on molluscs that is likely to lead to publication. The maximum amount available should not be considered as a 'target'; rather requests should reflect the research that is proposed. The grants are reviewed by a Reviewers Panel including both Council and non-Council members invited for that purpose.

Travel Grants

Travel Awards are available as bursaries to support attendance at a conference or workshop relevant to malacology. Grants are preferentially conferred on students but researchers without professional positions may also apply. The maximum amount for one of these awards is £500 for Society members and £300 for non-members. Preference will be given to members of the Society. There are two closing dates each year, 30th June for travel starting between 1st September of the current year and 28th February of the following year, and 15th December for travel starting between 1st March and 31st August of the following year.

For further information, guidance notes and to access the application form see here - http://malacsoc.org.uk/awards-and-grants/travel-grants

Annual Award

This Award is made each year for an exceptionally promising initial contribution to the study of molluscs. This is often a thesis or collection of publications. The value of the Award is £500. Candidates need not be a member of the Society but must be nominated by a member. There is no application form: the nominating member should send the material for evaluation with a covering letter or letter of support to the Honorary Awards Secretary. The closing date each year is 1st November. The winner(s) will be notified by 31st March, and announced at the Annual General Meeting.

Applications

Applications for Research Awards and Travel Grants should be sent to the Honorary Awards Secretary, Jonathan Ablett, Division of Invertebrates, Department of Life Sciences, Natural History Museum, London, SW7 5BD For further information, guidance notes and to access the grant application form see http://malacsoc.org.uk/awards-and-grants/research-grants Please note that all applications must be sent by email to MSL_awards@nhm.ac.uk.

Malacological Society of London—Membership notices

Objects

The objects of the Society are to advance education and research for the public benefit by the study of molluscs from both pure and applied aspects. We welcome as members all who are interested in the scientific study of molluscs. There are Ordinary Members, Student Members and Honorary Members. Members are entitled to receive a digital copy of the *Journal of Molluscan Studies* and such circulars as may be issued during their membership. The society's Web Site is at:

http://www.Malacsoc.org.uk

Publications

The Society has a continuous record of publishing important scientific papers on molluscs in the *Proceedings*, which evolved with Volume 42 into the *Journal of Molluscan Studies*. The *Journal* is published in annual volumes consisting of four parts which are available on -line by members and student members. The Society no longer produces paper copies of the Journal.

Members also receive on-line access to *The Malacologist*, which is the bulletin of the Society, issued twice a year, in February and August. *The Malacologist* is published on the website of the Society.

Meetings

In addition to traditional research on molluscan biology, physiological, chemical, molecular techniques are amongst the topics considered for discussion meetings and papers for publication in future volumes of the *Journal*.

Subscriptions

Membership fee structure

Ordinary Members: Journal on-line only £45
Student Members: Journal on-line only £25

Methods of Payment

(1) Sterling cheque to "The Malacological Society of London".

(2) Banker's standing order to: HSBC (Sort code 40-16-08 Account no. 54268210) 63-64 St Andrew's Street, Cambridge C32 3BZ

(3) Overseas members wishing to pay electronically should should use

IBAN GB54MIDL4016084268210
SWIFT/BIC MIDL GB22

(4) Credit card: Overseas members ONLY may pay by credit card: the Society can accept VISA and MasterCard payments only. Please provide the Membership Secretary with your card number and expiry date, card type (VISA or MasterCard.), the name on the card, and the cardholder's address (if this differs from your institutional address). Receipts will only be sent if specifically requested.

Institutional Subscriptions to the Journal

Enquiries should be addressed directly to Oxford University Press, Walton Street, Oxford OX2 6DP, U.K.

Change of Member's Address

Please inform the Membership Secretary of a change of postal or email address

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APPLICATION FOR MEMBERSHIP OF THE MALCOLOGICAL SOCIETY OF LONDON

I wish to apply for (please mark your choice) :-

Ordinary Members: Journal on-line only £45

Student Members: Journal on-line only £25

I enclose a cheque payable to "The Malacological Society of London" for my first annual subscription.

Title .... Name .....

Department ..... Institution .....

Street ..... City .....

Post /Zip Code ..... Country ..... Email .....

Malacological Interests .....

Signature ..... Date .....

Please send the completed form and cheque to the Membership Secretary:

REGISTERED CHARITY NUMBER: 275980

REPORT OF THE TRUSTEES AND UNAUDITED FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2020 FOR THE MALACOLOGICAL SOCIETY OF LONDON

Staffords
Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
Oakington Road, Girton
CAMBRIDGE
Cambridgeshire
CB3 0QH

THE MALACOLOGICAL SOCIETY OF LONDON

CONTENTS OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2020

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2020

The trustees present their report with the financial statements of the charity for the year ended 31 December 2020. The trustees have adopted the provisions of the Charities SORP (FRS102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

STRUCTURE, GOVERNANCE AND MANAGEMENT

Governing document

The charity is controlled by its governing document, a deed of trust, and constitutes an unincorporated charity.

The governing document is continually reviewed following its original adoption on 17 May 1978, with the current operative revision of the governing document being that amended on 28 April 2005.

Recruitment and appointment of new trustees

Nominations for Council (the board of related party) from members must be proposed and seconded and in the hands of the Secretary by December 31st. Members at the AGM 2016 proposed and seconded that only the Society's President and Officers (Treasurer, Secretary, Membership Secretary, Awards Secretary) are forming the board of trustees. It shall be the duty of Council to nominate members for election to the offices of President, Treasurer, Secretary, Membership Secretary, Editor of the Journal, Editor of the Bulletin, Archivist, Web Manager, and Awards Secretary, and for the vacancies in the Council caused by annual retirement. Nominations from the members and from Council shall be submitted to the Society with the notice convening the Annual General Meeting which shall be sent to every member of the Society not less than fourteen days before the Meeting.

In the case of a vacancy arising in any office of the Society, or in the Council, other than by way of resignation or retirement in the Annual General Meeting, the Council shall have power to appoint a temporary Council member to that vacancy until the next Annual General Meeting.

Risk management

The trustees have a duty to identify and review the risks to which the charity is exposed and to ensure appropriate controls are in place to provide reasonable assurance against fraud and error.

In particular:

(a) Admission fees and annual subscriptions shall be such sums as may be determined by a Special General Meeting convened under Rule VI(c), or at the Annual General Meeting.

(b) Subscriptions shall be due on the 1st of January in each year; but in the case of a new member, immediately after election. Members elected during the months of November and December, however, shall not be required to pay for the year in which they are elected.

(c) Any member whose current subscription has not been received in full by 31 January shall be reminded of the arrears in subscription and be informed that despatch of the Journal is suspended until the arrears are paid. No member whose subscription is twelve months in arrears shall be entitled to any of the privileges of the Society, and any member whose subscription is two years in arrears shall cease to be a member of the Society, unless the Council decide otherwise.

(d) The Council shall revise and publicise the conditions of the Society's awards and grants from time to time.

(e) For the purpose of legal protection of the property of the Society, all funds, books and other property shall be declared vested in Council as the Society's Trustees.

(f) The Council shall cause to be kept Minutes of Council and Society Meetings and books of account in respect of all receipts, payments, assets and liabilities. Accounts shall be presented to each Annual General Meeting for approval by members and such accounts shall be audited or independently examined as appropriate.

OBJECTIVES AND ACTIVITIES

Objectives and aims

The governing document contains the following in relation to the objective of the charity:

The objects of the Society are to advance education, research and learning for the public benefit in the study of molluscs from both pure and applied aspects. In furtherance of these objects, but not further or otherwise, the Society shall have the following powers:

(a) To promote and co-ordinate meetings and symposia,

(b) To promote and co-ordinate research both pure and applied;

(c) To provide for the worldwide dissemination of the useful results of such research by publication of the Journal of Molluscan Studies;

(d) To award prizes to outstanding students in the field of molluscan biology;

(e) To award research grants to individuals which will advance the study of molluscan biology;

(f) To do all such things as will further the objects of the Society.

Significant activities

In 2020 the Malacological Society of London had proposed meeting at the Marine Biological Association in Plymouth on "Limpets 2020" that had to be cancelled with a week's notice due to Covid-19, and the annual Molluscan Forum for Young Scientists was held virtually. The Society published the members' bulletin "The Malacologist" and in cooperation with Oxford University Press "Journal of Molluscan Studies".

Public benefit

The charity's objects are for the public benefit because increasing public knowledge is required as they form an important part of the global biodiversity and ecosystem stability which can have effects on human health and are a human food source.

ACHIEVEMENT AND PERFORMANCE

Charitable activities

In 2020 the main charitable activities were the funding of eleven research projects, of which nine claimed the grants (total cost of £12,262), eight to young researchers and malacologists in non-permanent positions and one to senior researchers, the support of 3 students and young researchers to attend conferences and training courses, an activity highly impacted by Covid-19 as the Society usually supports around 20 scientists here.

FINANCIAL REVIEW

The finances of the Malacological Society have been pleasing during 2020 with an overall gain of £52,220. This gain is explained by a gain in the Fixed Interest and Investment funds and lower awards and meeting expenditure.

Our investments had an overall gain of £28,997 (comparing market value at 31 December 2020 with market value at 31 December 2019), with the COIF Investment Fund making a gain of £25,132 and the COIF Fixed Interest Fund a gain of £3,865. During 2020, no funds were transferred from the current account to savings accounts.

Separately, the profit-share from the publication of the Journal of Molluscan Studies in 2020 provided the Society with most of its income contributing £48,890. The Editor of the Journal, Dr Dinarzarde Raheem, and the Assistant Editors are to be commended for their hard work contributing to the publication of our scientific journal. In addition, sales of the digital archives provided £507 of income.

In 2020, more funds were used for research awards, being £12,262 in 2020 compared to £8,696 in 2019, while travel awards remained similar, but there was reduced spending on Council meeting and Forum travel awards as meetings after January 2020 were held virtually. The Society (MSL) spent less money in 2020 compared to 2019, this was mainly based on less expenses paid for meetings and to the JMS editor for attendance expenses, Malacological conferences to promote our journal and network with potential assistant editors and authors.

REPORT OF THE TRUSTEES
FOR THE YEAR ENDED 31 DECEMBER 2020

REFERENCE AND ADMINISTRATIVE DETAILS

Registered Charity number
275980

Principal address
c/o British Antarctic Survey
High Cross
Madingley Road
CAMBRIDGE
CB3 0ET

Trustees

Dr J Grahame	President
Dr T White	Membership Secretary, elected 4th June 2020
Dr K Linse	Hon. Treasurer
Dr R Whittle	Hon. Secretary
J Ablett	Awards Officer
Dr T White	Ex-Membership Secretary, term ended 4th June 2020

Independent examiner
Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Approved by order of the board of trustees on ..... and signed on its behalf by:

.....
Dr John Grahame - Trustee

INDEPENDENT EXAMINER'S REPORT TO THE TRUSTEES OF THE MALACOLOGICAL SOCIETY OF LONDON

I report on the accounts for the year ended 31 December 2020 set out on pages five to ten.

Respective responsibilities of trustees and examiner
The charity's trustees are responsible for the preparation of the accounts. The charity's trustees consider that an audit is not required for this year (under Section 144(2) of the Charities Act 2011 (the 2011 Act)) and that an independent examination is required.

It is my responsibility to:

- examine the accounts under Section 145 of the 2011 Act
- to follow the procedures laid down in the General Directions given by the Charity Commission (under Section 145(5)(b) of the 2011 Act); and
- to state whether particular matters have come to my attention.

Basis of the independent examiner's report
My examination was carried out in accordance with the General Directions given by the Charity Commission. An examination includes a review of the accounting records kept by the charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and seeking explanations from you as trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit, and consequently no opinion is given as to whether the accounts present a 'true and fair view ' and the report is limited to those matters set out in the statements below.

Independent examiner's statement
In connection with my examination, no matter has come to my attention:

(1) which gives me reasonable cause to believe that, in any material respect, the requirements

- to keep accounting records in accordance with Section 130 of the 2011 Act; and
- to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the 2011 Act

have not been met; or

(2) to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

Steven Ellis FCA
Staffords Chartered Accountants
Unit 1, Cambridge House
Camboro Business Park
CAMBRIDGE
Cambridgeshire
CB3 0QH

Date: .....

The Malacological Society of London

Statement of Financial acitivities (incorporating an income and expenditure account) for the year ended 31st December 2020

Note			TOTAL 2020	TOTAL 2019
	INCOMING RESOURCES			
	Income from Activities of the Charity			
	Members' Subscriptions: Current Year		1,670	2,335
	Collection of Subscription Arrears		-	-
4	OUP: Income from Journal Publication		48,890	48,620
2	Income from sale of Digital Archive		507	1,351
	Sundry Income		66	100
	Donations		-	20
	Income from Investments			
3	Interest	CCLA	6	12
3	Dividends		3,706	3,706
	TOTAL INCOMING RESOURCES		**54,844**	**56,143**
	RESOURCES USED			
	Awards			
	Annual Award		-	-
	WCM Award		-	100
7	Research Awards (Early career & Senior)		12,262	8,696
	EuroMal 2020 award		-	1,800
7	Travel Bursaries for conferences		1,050	2,100
5,6	Travel awards: AGM		1,240	412
5,6	Travel awards: Forum		-	2,070
			14,552	**15,178**
	Directly Relating to Work of Charity			
4	Journal expenses		4,637	4,750
4	Journal colour plates		8,280	5,220
4	Journal editor expenses, incl meetings		1,644	5,285
5	Bulletin Expenses		41	148
6	Meeting Expenses		358	5,663
	Independent examiners expenses		1,128	1,080
5,6	Council Meeting travel expenses		738	1,795
	Web sites		-	-
5	Postage, Printing & Stationary		-	-
	Charges for cc subscription collection		18	37
	Bank charges		222	204
	Sundries		4	2
	Total		**31,621**	**39,363**
	NET INCOME		**23,223**	**16,780**
8	GAIN ON REVALUATION OF FIXED ASSETS		28,997	49,217
	NET MOVEMENT IN FUNDS		52,220	65,997
	TOTAL FUNDS BROUGHT FORWARD		391,090	325,093
	TOTAL FUNDS CARRIED FORWARD		**443,310**	**391,090**

CONTINUING OPERATIONS

All income and expenditure has arisen from continuing activities.

The Malacological Society of London

Balance Sheet at 31 December 2020

Note		2020	2019
		£	£
	FIXED ASSETS	**400,619**	**371,622**
8	Tangible Assets		
	CURRENT ASSESTS		
11	Debtor	-	-
9	Cash at Banks	55,819	32,548
10	CREDITORS: (Amounts falling due within one year)	- 13,128	- 13,080
	NET CURRENT ASSETS	**42,691**	**19,468**
	TOTAL NET ASSETS	**443,310**	**391,090**
	FUNDS		
	Unrestricted (Designated):		
11	Annual Award Fund	6,500	6,500
11	CM Yonge Award Fund	9,250	9,250
11	Centenary Research Award Fund	80,000	80,000
		95,750	95,750
11	General reserve Fund	347,560	295,340
	TOTAL FUNDS	**443,310**	**391,090**

Katrin Linse
Honorary Treasurer & Trustee

Dated

John Grahame
President & Trustee

Dated

The Malacological Society of London

Notes to the Financial Statements for the year ended 31st December 2020

1. ACCOUNTING POLICIES

Basis of Preparing the Financial Statements

The financial statements have been prepared in accordance with the Charities SORP (FRS 102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standards applicable in the UK and Republic of Ireland (FRS 102)(effective 1 January 2015)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

- The SORP normally requires a columnar fomat, in this entities case the trustees' view is this is not appropriate as there are neither restricted funds nor endowment funds and so all of the activity in the year would fall within the unrestricted fund column.

Accounting Convention

The financial statements have been preprared under the historical cost convention, except for those items described immediately below.

- The historic cost basis of accounting is used except for investments, which have been included at their market value where readily available at the yearend date.

Going concern

The Trustees consider that there are no material uncertainties about the charity's ability to continue as a going concern.

Reconciliation with previously Generally Accepted Accounting Practice

In preparing the accounts, the trustees have considered whether in applying the accounting policies required by FRS102 and the Charities SORP FRS 102 the reinstatement of comparative items was required. In the case of this charity, no changes were made.

Fund accounting

- The Society funds, including funds available for awrds, are not subject to any restrictions regarding their use, and are available to be used for the general purposes of the Charity. Consequently they are classified as 'Designated Funds'.

Taxation

- The charity is exempt from tax on its charitable activities.

Significant judgements

Apart from those judgements involving estimations, the management has not made any judgements in the process of applying the entity's accounting policies that have significant effect on the amounts recognised in the accounts. There are no key assumptions concerning the future or other key sources or estimation uncertainty at the reporting date that have significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next reporting period.

Financial reporting standard 102 - reduced disclosure exemption

The charity has taken advantage of the following disclosure exemption in preparing these financial statements, as permitted by FRS 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland':

- the requirements of Section 7 Statement of Cash Flows

Resources Expended

Expenditure is accounted for on an accruals basis and has been classified under headings that aggregate all cost related to the category. Where costs cannot be directly attributed to particular headings they have been allocated to activities on a basis consistent with the use of resources.

Incoming Resources
All income is recognised in the Statement of Financial Activities once the charity has entitlement to the funds, it is probable that the income will be received and the amount can be measured reliably.

Foreign currencies
- Asessts and liabilities in foreign currencies are translated into sterling at the rates of exchange ruling at the balance sheet date. Transactions in foreign currencies are tranlated into sterling at the rates of exchange ruling at the date of transaction. Exchange differences are taken into account in arriving at the operating result.

Incoming Resources and Resources used
· Subscriptions for annual membership are treated as follows:

Pre-paid in prior year	Liabilities
Paid in current year	Incoming Resource: subscriptions
Unpaid at 31st December	Not included in accounts. No debtor
Subsequently recieved	Incoming Resource: collection of subscriptions in arrears

· The costs of the Society Journal and supplements are written off in the year of initial distribution.
· The Profit Share from Oxford Journals is included in the year of receipt and not accrued.
The amount of Profit Share cannot be determined accurately by OUP until after the Society's AGM.

2. SALE OF THE DIGITAL ARCHIVE BY OUP
Since 2010 the sale of the digital archives by OUP has generated a windfall profit of £13,969 in 2010, £9,284 in 2011, £7,299 in 2012, £10,068 in 2013, £7827 in 2014, £10,590 in 2015, £2,805 in 2016, £10,429 in 2017, £4238 in 2018, and £1352 in 2019.
Although the main customers for this product have now purchased the archive and OUP has split archive sales into subjects, digital archive sales are still ongoing with £507 in 2020.

3. INTERESTS & DIVIDENDS
Income has been derived from the following sources and has been applied to funds as indicated:

		2020	2019
		£	£
Sources	COIF Deposit Fund Interest	6	12
	COIF Fixed Interest Fund Dividend	3,706	3,706
	COIF Investment Fund Dividend		
		3,712	**3,718**
Beneficiary	Revenue Fund	1,179	1,181
	Annual Award Fund	194	194
	CM Yonge Award Fund	273	273
	Research Grants other Funds	2,066	2,070
		3,712	**3,718**

4. JOURNAL The surplus resulting from publication of the Journal is as follows

	2020	2019
	£	£
Profit Share from OUP	49,397	49,971
Less: sales of digital archives	- 507	- 1,352
Profit Share from OUP re Journal	**48,890**	**48,619**
Less:printing costs	- 12,000	- 12,000
plates	- 8,280	- 5,220
Editor & CM meeting expenses	- 1,644	- 5,285
Under/over-provision in previous year	6,858	7,250
Surplus on publication of the Journal	**33,824**	**33,364**

5. RELATED PARTY TRANSACTIONS AND TRUSTEES' EXPENSES

No Trustee or Council Member has recieved any renumeration during the current or previous year. Expenses paid by Trustees and Council Members on behalf of the Society have been reimbursed during the current year as follows.

Trustee	Date	£	Reason
Raheem	21.01.20	20.00	WCM travel
Raheem	21.01.20	812.00	JMS edits
Wood	21.01.20	85.50	Council meeting travel
Fenberg	22.01.20	23.95	Council meeting travel
Cameron	22.01.20	45.80	Council meeting travel
Hodgson	22.01.20	50.80	Council meeting travel
Grahame	22.01.20	67.90	Council meeting travel
Grahame	22.01.20	237.89	Council meeting travel
Linse	22.01.20	23.45	Council meeting travel
Hollyman	22.01.20	26.90	Council meeting travel
Whittle	22.01.20	23.45	Council meeting travel
Dussart	22.01.20	26.45	Council meeting travel
Wall-Palmer	22.01.20	107.00	Council meeting travel
Sumner-Rooney	22.01.20	18.60	Council meeting travel
Raheem	15.06.20	812.00	JMS edit support
Grahame	15.06.20	14.39	Zoom licence CM
Hollyman	09.11.20	148.79	Zoom licence Forum
Grahame	14.12.20	14.39	Zoom licence CM
Dussart	15.12.20	40.68	Malacologist

6. MEETING EXPENSES

The following costs have been incurred on meetings for the Society:

		2020	2019
		£	£
AGM:	Speakers travel	1,240	412
	General	-	183
	Dinner	-	204
Forum:	Travel	-	2,070
	Reception drinks	-	158
	Zoom	149	-
	General 2018 (invoiced in 2019)	-	2,419
	Benugo (General 2019)	-	2,700
Council:	Travel	738	1,795
	Zoom	15	-
		2,126	**9,940**

7. GRANTS AND AWARDS TO INSTITUTIONS

Although grants and awards are given to individuals, in many cases those individuals are affiliated with an institution. Under the SORP, the Society is required to give an analysis of the range of institutions for whom grants and awards are paid:

	£	
Early Career Res. Grants:	1,420	University of Aberdeen (UK)
	1,500	Assoziazone Cheph (It)
	1,100	Keio University (Jp)
	1,460	University of Bilbao (Spain)
	1,402	University of Exceter (UK)
	1,457	University of Adelaide
	1,500	University of St Andrews (UK)
	1,500	University of Turin (It)
Senior Research Grants	923	Clarkson University (US)

In the year the total amount of grants to institutions was £12,262.25.

8. INVESTMENTS

In 2020 no funds were transferred to the COIF Investment fund and to the Fixed Interest Fund.
The following investments are held as at 31st December 2020

	Number of units	Price	Market Value	Book Value
		31-Dec-20	31-Dec-20	31-Dec-19
		£	£	£
COIF Investment Fund (Accumulation Units)	1,364.59	206.603	281,928	256,796
COIF Fixed Interest Fund	83,479.39	1.4218	118,691	114,826
			400,619	**371,622**

These investments have been valued at market price (£400,619) in the Balance sheet, with appropriate adjustment (£28,997 - £0 transfers) for the increase in their value (£28,997) in the Statement of Financial activities as an unrealised gain.

9. CASH DEPOSITS

The following accounts are held and the balances in each account are:

	2020	2019
	£	£
Northern Bank Current Account	-	-
COIF Deposit	2,101	96
Pay Pal	-	-
HSBC Bank Current Account	53,718	30,452
Total	**55,819**	**30,548**

10. CURRENT ASSESTS & LIABILITIES

The following debtors are outstanding

	2020	2019
	£	£
Forum Travel awards not used	-	-

The following creditors are outstanding:

	2020	2019
	£	£
Society Journal (provision)	12,000	12,000
Accruals	1,128	1,080
	13,128	**13,080**

11. UNRESTRICTED FUNDS

The following movements have taken place within the Society's four designated funds:

	Revenue	Annual Award	CM Yonge Award	Reseach & other Awards	Total
	£	£	£	£	£
Balance: 1st January 2020	**295,340**	**6,500**	**9,250**	**80,000**	**391,090**
Interest Earned	1,178	194	273	2,066	**3,711**
Grants	-	-	-	- 15,632	**- 15,632**
Allocated Surplus: 2020	51,042	- 194	- 273	13,566	**64,141**
Balance: 31st December 2020	**347,560**	**6,500**	**9,250**	**80,000**	**443,310**

The Trustees can, by resolution at one of their meetings, re-designate these funds for other purposes.