



Newsletter

Winter
2001
No 44



Evolution of
Developmental Mechanisms

Spring Meeting 2002

BSDB Newsletter

Winter 2001

No. 44

Editorial

The sobering events of September 11th and the ensuing conflict in Afghanistan have focussed my thoughts on the welfare of future generations. So perhaps it is fitting that, albeit inadvertently, this issue sees an emphasis on education issues.

E.O. Wilson observes in his book "Consilience", "if you choose an academic career you will need forty hours a week to perform teaching and administrative duties", a further twenty hours to do "respectable" science, and still another twenty to do "really important research". Whilst the actual number of hours he suggests may come as a shock to some, it is the split of time that he acknowledges that is important, recognising the obligation we have to our successors (born of a debt to our mentors). I have been admonished before for pointing this out (last issue), but it remains the case that many among us still regard teaching as a chore, however essentially shortsighted that may be. Whatever your attitude, if time must be spent teaching it may as well be done well. Part of achieving this is to use the right tools, and to be realistic about one's goals. Both of these issues are addressed in different places in this edition.

On top of a bumper crop of book reviews is a triple review by Laurie Haynes of the three main developmental biology teaching texts, "Gilbert", "Wolpert" and now "Slack". This was a mammoth task, for which I am extremely grateful to Laurie, and of which he has made an excellent job, not only incisively reviewing the books but also making insightful comments about the nature of developmental biology teaching which will come as a relief to those struggling to connect with their students.

Elsewhere, we hear more from the LTSN (see No. 42) where Jenny Lewis reflects on the merits of setting students realistic goals, and more lessons on reaching one's intended audience are to be found in Robert Whittle's review of *The Coiled Spring* by Ethan Bier.

Robert also writes about another aspect of communicating science, namely our continuing efforts to bring science to art (or is it the other way around?) at the Spring meeting. After the success of the Wellcome Image Competition this year, Robert is co-ordinating a more extensive exhibit featuring five or six artists working at the interface between the two disciplines.

Last, but by no means least, you should have noticed a change to the cover, which now incorporates the **new BSDB logo**. This bold design was contributed by Jeff Christiansen and was the overwhelming winner of the logo competition announced in the last issue (see inside back page for more details).

More Newsletter contributions please. Send to me, Andy Furley, at a.j.furley@sheffield.ac.uk

The Editor

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BSDB Spring Meeting 2002

Evolution of Developmental Mechanisms

York, 20th – 23rd March

See pages 8 & 9 for details. Registration and Abstract Submission will be online:

www.ana.ed.ac.uk/BSDB/

or

www.bsdb.org

Registration and Abstract Deadline

18th January, 2002

Cover Legend: an ascidian embryo drawn by Conklin and from E G Conklin (1905) "The organisation and cell lineage of the ascidian egg." *J Acad Nat Sci, Philadelphia* ser 2, 13:1-119. Reproduced with permission of the Academy of Natural Sciences of Philadelphia

From the Chairman

At the ISDB Symposium in Kyoto this summer, I was reminded – if I needed to be – of just how much excellent research in developmental biology is done in Japan. There must be many opportunities to do interesting and original post-doctoral work in this fascinating country, especially with the opening of the new RIKEN Center for Developmental Biology in Kobe next year. Yet my impression is that few of us here in the UK give this possibility serious consideration. Certainly during my time on the Human Frontiers of Science Programme (HFSP) Fellowship panel I saw few applications from Europeans to visit Japanese laboratories – a lamentable state of affairs given that the Japanese government is the major contributor to the HFSP.

This gulf between East and West was underlined by the distribution of nationalities attending the Kyoto Symposium, though I was impressed by the fact that, after the USA, the UK was the best represented country outside of Japan. Nevertheless, we were heavily outnumbered by our hosts; of course, to a large extent this reflected the high cost of attending such a meeting, a situation that Europeans will face once again in 2005, as it was agreed in Kyoto that the next Symposium should be held in Australia. This raises obvious questions about the relevance of the ISDB to the developmental biology community world-wide, an issue which the new President of the ISDB, Eddy de Robertis seems keen to address. He has raised some interesting suggestions for more involvement of the ISDB in regional meetings, a possibility that I will be pursuing with him in the coming months.

Another international organisation with a visionary new President, is EDBO, (the European Developmental Biology Organisation) to which the BSDB has been affiliated for many years. After successfully presiding over

the Spanish Developmental Biology Society, Antonio Garcia-Bellido is taking over the reins at EDBO and has ambitious plans to make it THE forum for developmental biology across the continent. I had the opportunity to discuss some of these ideas with Antonio at our Autumn Meeting in Oxford. As the major Society within Europe the BSDB is in a strong position to contribute to future developments across the continent and I hope that we can work with Antonio in the coming months to bring some of his ideas to fruition. As a prelude to more European integration, we have reached an agreement with our sister society in France to hold a joint meeting in 2003. This will take the place of our usual Autumn meeting and is scheduled to be held in Nice. Given that the cost of travelling to Nice from Luton and Liverpool is nowadays significantly less than the average rail fare between any two cities in the U.K., this rather more exotic venue should not prohibit attendance at what promises to be a very stimulating and productive meeting. More details will appear in subsequent editions of the Newsletter.

Finally, I must thank Marcel van den Heuvel for organising such an excellent meeting in Oxford this Autumn – and congratulate him on pulling off an impressive coup by inviting the winner of this year's Nobel Prize for Medicine to give the final talk! This was a fitting end to a thoughtfully constructed programme, the quality of which was reflected by the fact that the meeting was significantly oversubscribed. Let's hope this standard can be maintained in future years.

Phil Ingham

News (& Views)

BSDB Committee changes

Welcome to new committee members Mike Jones, Nancy Papalopulu and Leigh Wilson (student representative; apologies, Leigh, for getting your name wrong in the last issue. Ed).

Next September sees the departure of Paul Martin and JulieAhringer. Thus, we are seeking nominations for **two new Committee members**. Our constitution requires that each nomination be supported by two members of the Society. Nominations should be sent to Ivor Mason using the form on p5 The closing date for nominations is 2 weeks prior to the Spring meeting.

Monthly updates on meetings, jobs, etc. for BSDB members (by e-mail)

As we are about to start a monthly update service – to bring you news of forthcoming **meetings, seminars, book reviews, journal offers** and **jobs** in developmental biology – you may wish to **let us know your e-mail address** (this service will NOT be available if we don't have this). To do this, contact Ivor Mason on BSDB@kcl.ac.uk putting "E-mail update" in the Subject heading.

Sci-Art at the BSDB Spring meeting 2002 in York

The BSDB Committee is supporting the creation of a small science-art exhibition which will run throughout the annual spring meeting in March 2002 at the University of York. This is a novel and exciting venture, with serious intentions, though to some it will seem a surprise item and to others perhaps even a travesty of science. But what is the idea?

The term sci-art embraces a broad field of artistic endeavour in which the theme, the inspiration or starting point for the artist's work comes from within science. Some sci-art is the outcome of long-term collaboration between, and discussion within, a partnership formed between a practising artist and scientist. Other artwork may have been prompted by ideas coming to an artist from science but 'at arm's length' from the science, perhaps via the media. Yet other pieces may have been commissioned from within the world of science, specifically to illustrate and publicise a scientific idea or event, and in this sense are rather closer to the outcome of a graphic design brief or the commissioning of art. This spectrum of origins and inputs means that some sci-art may pursue and explore the conceptual ideas of

science, other art may arise from the very images that appear on our monitors after its 'capture', whereas yet other creations may provoke or challenge or even subvert our perceptions of science.

In step with the widespread aim within contemporary science to engage in dialogue and to communicate with the public, the BSDB wishes to pursue other ways of promoting the public understanding of, and fondness for science and specifically cell and developmental biology. The huge public interest and concerns that genome projects, transgenic organisms and therapeutic stem cell cloning have engendered suggests that there is considerable scope for dialogue and communication. We need the public to be excited and inspired by what we do rather than confused and frightened. Staging this exhibition will be a first step in finding out whether sci-art is a suitable vehicle with which to achieve this aim.

We intend to make the exhibition, which will be located within the BSDB conference venue, open by invitation to the entire York University community, to schools in the York area, to local colleges of art, and to members of local professional art networks. The hope is that an initial interest or curiosity in this art exhibition will bring people outside the BSDB close enough and for long enough, for them to pick up the intellectual excitement within cell and developmental biology as well as its practical promise for a better understanding of the biological world, including ourselves.

My own limited experience of working in a collaboration with an installation artist was that I found it stimulating to debate issues, and to explain ideas that had arisen within developmental biology. The origins of individual sci-art activity are legion, and my own expectations of the outcomes have vacillated from the totally empirical - from something I feel 'good' about in an ill-defined way - to the possibility that a transformation by an artist of an idea arising within developmental biology into a statement within a completely different medium and language might give me some new insight into the process or system that I am trying to understand in the laboratory.

My plan is to exhibit work from five or six artists that have in some way been inspired by cell and developmental biology, and for the artwork to cover the full spectrum of media. There will be classic paintings of chick embryos in ovo, through abstract oils of coiled DNA, to the clothing designs of Helen Storey inspired by embryonic tissues and organs, and an installation inspired by ideas of immortality and heritability in Hela cells.

We might expect the response and the dialogue with those who visit this show to be rather different from that in most art galleries, and I hope that several of the artists whose work will be in York will be present at the exhibition. We are used to our colleagues asking us to 'talk them through the poster' but within the art world, the convention is not usually for an artists to engage with the public in front of their art. These new interactions should be interesting for all parties.

My expectation is that this event may help us set up links or open up opportunities for people to approach our science through another route. In not one iota will this exhibition change the process of peer review, the competition for research funding and the evidentially-based practice of science, but I am interested to see whether this event offers another vehicle with which to

communication with the public as well as to listen to them. I hope you like the show.

Robert Whittle, Brighton

UK Life Sciences Committee

Hottest news to report is that Prof Nancy Rothwell, a prolific and classy neuroscientist from Manchester, who has previously championed the use of animal experiments by bioscientists for the UKLSC, has agreed to take over the UKLSC Chair when Martin Raff retires shortly.

There have been several meetings chaired by David Lewis and John Arbutnot to discuss the need for a BioSciences Federation to represent life sciences in the way that Royal Soc of Chemistry and Inst of Physics represent the physical sciences. The consensus view seems to be that this federation should evolve alongside our current organisations such as Inst of Biology and UKLSC until it can take over more and more of their functions - more news on this evolutionary progression in the Spring of 2002.

Paul Martin, UCL

.....and, in passing, a note from Martin Raff

Thanks for writing such a positive comment on UKLSC in the BSDB Newsletter. The UKLSC can use all the publicity it can get.

I just wanted to correct one thing. The UKLSC was not my brainchild. I was recruited to be chairperson after it was set up by a group of learned societies. I was not involved in either its conception or birth.

Teaching – thoughts on setting realistic objectives.

This article first appeared in the LTSN Bioscience Bulletin (4) (<http://bio.ltsn.ac.uk/>) and is the third of four articles which present recent work on teaching and learning in the biosciences at the University of Leeds. LTSN is the Learning and Teaching Support Network, and the Centre for Bioscience is located in Leeds.

Mini-projects, designed to help students make the transition from set practical work to open ended third year projects, are included in a second year biology course at the University of Leeds. They are intended to develop:

- student's awareness of the difficulties of collecting reliable data and the need to set realistic targets;
- student's understanding of the relationship between theory and practice and the need to use theory to inform planning and interpret data.

The students, working in groups of 6, are asked to map uncharacterised mutations of *C. elegans*. They are provided with a number of worm stocks carrying different mutations and a handbook, which details the reproductive habits and genetics of *C. elegans* and describes the process of gene mapping. They are also given an introductory lecture which outlines the main learning objectives, identifies some of the challenges and demonstrates some of the practical skills that are needed. The students are then expected to use their knowledge of Mendelian genetics to plan the initial experimental work, interpret the resulting data and inform further experimental design. They are given 5-6 weeks to com-

L'Oréal/Royal Institution Science Graduate of the Year Award



The Royal Institution
of Great Britain

Applications for the L'Oréal/Royal Institution Science Graduate of the Year Award are invited from **students working in the life sciences**, chemistry, plant sciences and medicine. The award is open to young researchers in British Universities who have not yet submitted their doctoral thesis. It is **intended to recognise research of a ground-breaking nature, involving risk-taking projects and the will to innovate**. The value of the award is **£5000**, plus an additional sum of £1000 intended to facilitate either travel to laboratories carrying out work of direct interest to the award winner or travel of a more broadly cultural description. The winner of the award will also be given free life membership of the Royal Institution. Candidates should accompany their application with a one-page summary of their research, indicating the way in which it will be ground breaking, together with a report from their supervisor.

Further particulars may be obtained from the Head of Programmes, to whom a letter of application, together with a CV, should be sent to arrive **no later than 1 March 2002**.

Dr Gail Cardew, Head of Programmes,
The Royal Institution, 21 Albemarle Street, London W1S 4BS,
Tel: 020 7670 2978, Fax: 020 7670 2920, Email: gail@ri.ac.uk
<http://www.ri.ac.uk>

plete the task and are supported in their work by one lecturer and one technician.

In this case study, observations of one group as they went through the process, plus interviews with students and the lecturer, were used to identify learning objectives and assess the learning demands which the project made on the students. These findings were then used to identify factors influencing the learning outcomes.

It was immediately apparent that the students' main objective, to succeed in the practical aim, was in potential conflict with the lecturer's learning objective - that students should develop an understanding of the difficulties of collecting reliable data through reflection on their own difficulties in achieving the practical aim. A certain sense of failure and frustration was going to be an inevitable part of this learning process.

There was clear evidence that the learning objective was achieved. As one student said:

"You read a research paper, these research papers that get published are really good (sic) ... It's easy to think that science has been 100% successful all the time ... but when something fails like this [their project] you can imagine there's a lot of hard work and a lot of failed attempts and what you see in the publications are probably just the top 0.01%."

Despite this, the majority of students were unaware of the learning gains that they had made and were dependent at their lack of results. They also remained largely unaware of the need to use theory to inform their planning - the lecturer's second objective.

Analysis of the practical aims and learning objectives showed that they made very heavy demands on the

students and were over ambitious, especially within the time available. Learning demands included: the development of new technical skills; good organisational skills; effective communication and group working skills; a better understanding of the theory and an awareness of how to use theory to inform planning.

There was a need to focus and prioritise the learning objectives and related learning demands so that strategies to support students in their learning could be developed. For example, if the students were to succeed at the practical task then they needed to plan carefully and effectively. This required an understanding of the relationship between theory and practice. Thus the students needed to spend more time on planning, supported by structured activities which made the link between theory and practice explicit, before embarking on the practical work. They also needed more opportunities to discuss their findings, and their interpretation of them, with more experienced researchers.

Jenny Lewis

Lecturer in Biology Education, Centre for Studies in Science and Mathematics Education, University of Leeds, j.m.lewis@education.leeds.ac.uk

..... and, in passing, are lectures dead?

If you do check out the LTSN Bioscience Newsletter (<http://bio.ltsn.ac.uk>), have a look at the piece by Alan Cann "The e-Student Arrives" (p6, issue 4) in which he reports on a new survey that shows that 95% of students are now saying that they prefer "computer-assisted learning technology".

News, Letters and Comments to the Editor
a.j.furley@sheffield.ac.uk

Call for Committee Nominations

Nomination Form: New Committee Members

Nominations are sought for two positions on the Committee of the British Society for Developmental Biology. Each nomination must be supported by the signatures of two BSDB members and must be submitted to the Secretary, Ivor Mason, not less than two weeks before the Annual General Meeting, which will be held on Friday 22nd March, 2002 at the BSDB Spring Meeting in York (see p8)

Nominee:

Contact details:

.....

.....

.....

I declare that, if elected, I agree to serve as a BSDB Committee member for a period of five years from the date of election.

Signature:

Supported by:

BSDB Member: Since

Signature:

BSDB Member: Since

Signature:

Please photocopy this page and send or fax the completed form to the Secretary:

Prof. Ivor Mason
MRC Centre for Developmental Neurobiology,
King's College London,
4th Flr, New Hunt's House,
Guy's Campus,
London SE1 1UL.
Tel: 0207 848 6547
Fax: 0207 848 6550
e-mail: bsdb@kcl.ac.uk

**Deadline for receipt:
March 8th, 2002**

From the Treasurer

Travel Grants

Thanks to the continued generous support of the Company of Biologists, the BSDB awards three types of travel grant to members, with preference given to graduate students and postdocs.

BSDB Spring and Autumn meetings:

These are the only UK meetings for which there is BSDB support, and grants cover basic travel and conference expenses (but not conference dinners!). We are currently able to fund demand but, if numbers increase, preference will be given to members who present posters.

BSDB members based abroad are eligible for a contribution (max £400) towards attending BSDB meetings.

Practical courses: Support of up to £500 is available for these courses and, at the moment, all applicants are funded. If more than about 8 members a year apply, however, a selection procedure will be introduced.

Foreign meetings: This is the category for which there is greatest demand and we cannot fund everyone. BSDB will give members a contribution (max £400). Current policy is as follows: no more than two people from one Department or one person from a group will be awarded a grant to go to a particular meeting. Preference will be given to members presenting work.

Other activities: The Treasurer now has a small additional fund to support other activities eg. travel within the UK, or the USA, in order to visit laboratories. Please email the Treasurer with any appropriate request.

Small Meetings

Members may approach the Treasurer for seed funding to help with organising developmental biology events (eg one-day meetings) that involve other institutions and at which students and postdocs are encouraged to attend and present work. The BSDB currently supports the meetings of

several local developmental biology groups with small (~£250) annual contributions. Any further requests for this type of funding should be made in a letter to the Treasurer.

Louie Hamilton Fund

There is a small amount of money available from the Louie Hamilton Fund to provide travel support for handicapped members. Applicants should contact the Treasurer.

TO APPLY FOR A TRAVEL GRANT:

- Members should first complete the Travel Grant Application form and send it to the Treasurer. (see **Forms** section at the back of this issue or see the BSDB website: www.ana.ed.ac.uk/BSDB/bsdbgrant.htm)
- Application 3-4 months in advance is advised so that the BSDB contribution can be used as a lever to prise the rest of the money from other sources. No grants will awarded in arrears
- **All applications for grants to attend a BSDB meeting must be in the Treasurer's hands a week before the meeting deadline.**

Please note: no-one will be awarded more than one travel grant per year.

Financial Report see opposite

SUBSCRIPTIONS

****1997** "Student-rate" members should quickly upgrade their subscription to **£20 or they will be culled (humanely).**

Ottoline Leyser

Graduate Students

The *NEW* Graduate Student Rep on the BSDB Committee is **Leigh Wilson**. Her job is to communicate Graduate Student views (good or bad) to the Committee, so please do not hesitate to contact her - see the addresses page at the back. Leigh would like to encourage all students to **apply for the travel grants**, not only to BSDB meetings but for overseas meetings, courses, and workshops as well. The BSDB offers very generous travel grants and students in particular should take advantage of their membership while it lasts! The BSDB is far more generous than other societies in this respect!

****Graduate Students: see Graduate Student of the Year Award announcement on page 4****

BRITISH SOCIETY FOR DEVELOPMENTAL BIOLOGY

FINANCIAL STATEMENT YEAR ENDING JULY 31st 2001

Balance Sheet

<u>1999/00</u>		<u>2000/01</u>
£		£
<u>107,636</u>	Investments	<u>100,366</u>
	Baillie Gifford Managed Fund (1,2)	
	Current Assets	
26,228	Barclays Bank High Interest Account (2)	27,241
8,393	Barclays Bank Current Account	17,863
2,798	Barclays Bank: Louis Hamilton Account (3)	2,857
37,419		47,962
1,441	Less: Unpresented cheques	8,101
<u>35,978</u>	Net Current Assets	<u>39,861</u>
<u>143,614</u>	Total Funds	<u>140,227</u>

Income & Expenditure Account

<u>Income</u>	<u>£</u>	<u>Expenditure</u>	<u>£</u>
Membership (Standing Order)	15,793	Grants (Travel & Courses)	42,693
Membership (Cheques)	465	UKLSC etc	660
Capitation Fee (CoB)	13,180	Newsletter	5,284
Travel grant fund (CoB)	35,000	Small meetings and other DB meetings	4,172
Sale of addresses	2,334	York Meeting	6,872
		Brighton Meeting	- 7,138
Interest and Investment Appreciation:		99/00 meetings and 00/01 meetings	9,546
Barclays High Interest a/c	1013	Committee & administration	2,191
Barclays Louis Hamilton a/c	60	Bank charges	87
Barclays Current Account	406		
	-	Total Expenditure	<u>64,367</u>
		Net Surplus for the Year	3,883
Total Income	<u>68,250</u>	Unrealised Gains on Baillie Gifford Managed Fund	- 7,270
		Fund balance at 31st July 2000	143,614
		Fund balance at 31st July 2001	<u>140,227</u>

Notes

These accounts were prepared under the historic cost convention, in accordance with the applicable accounting standards and Recommended Practice of Accounting by Charities. There have been no major changes to our financial arrangements this year.

1. The Baillie Gifford and Barclay High Interest Account valuations are on 30.6.01 (the 2000/01 BG loss is ~7%).
2. This account includes £25,500, the surplus on BSDB practical courses; this is used to provide grants for members to go on courses, and £6,081 was spent in 2000/01 for this purpose.
3. This is the only restricted account and no call was made on it in the financial year 2000/01

Next BSDB Meeting

BSDB/ Genetics Society/ BSCB Joint Spring Meeting

EVOLUTION OF DEVELOPMENTAL MECHANISMS

University of York, Wednesday 20th – Saturday 23rd March, 2002

Scientific Organizers:

Peter Holland (Chair), Michael Akam, Enrico Coen, Paul Nurse, Vivian Irish, Jayne Richards, Jane Langdale

In the past 15 years, the interface between developmental biology and evolution has re-emerged as an exciting and productive area of research. The topic has received an added impetus as complete or near complete genomes have been acquired for a diversity of organisms. The spring 2002 symposium, organised jointly by The Genetics Society and BSDB, will focus at the interface between development, evolution and genomics. The partnership between GenSoc and BSDB means that we have been able to invite a wide range of speakers from Europe, USA and Japan, and we can look forward to a high quality and very timely symposium. It is hoped that several contributed talks can also be included in the program selected from submitted abstracts. Posters describing research on all areas of the subject are encouraged.

Provisional Programme

Wednesday 20th

Registration
GS/BSCB Committee meetings
Drinks reception
Dinner

**Abstract/Registration
Deadline
18th January, 2002**

Thursday 21st

- 9-9.50 **BSCB Plenary**
- 10-10.50 **Genomes, Evolution and Development**
Chair: Peter Holland
Jonathan Hodgkin: Lessons from insect and nematode genomes
Nori Satoh: The ascidian genome project
- 10.50-11.20 Coffee
- 11.20-12.35 **Paul Nurse:** Fission yeast genome and development
Virginia Walbot: Plant genome evolution
John Postlethwait: Chordate genome evolution
- 12.35-2 Lunch and Posters
- 2-2.45 **Balfour Lecture**
Adam Eyre-Walker
- 3-3.50 **Evolution of gene regulation**
Chair: Paul Nurse
Denis Duboule: Hox gene regulation
Mike Levine: Evolution of gene networks
- 3.50-4.30 Tea/Posters
- 4.30-6.30 **Parallel a: Promega Young Life Scientist of the Year**
Parallel b: Workshop on Molecular Phylogeny
Sandra Baldauf, Peter Holland et al
- 7.30-11.00 Drinks reception and banquet dinner at Railway Museum
Announcement of Promega winner

**PhD students (& Supervisors)
Don't miss the Graduate Student
of the Year Award announcement
See page 4**

Next BSDB Meeting

Friday 22nd

- 9-10.40 **Microevolution of development**
Chair: Enrico Coen
Paul Brakefield: Butterfly wing spots: evolution, ecology and development
David Stern: Microevolution of Drosophila morphology
John Doebley: Microevolution of maize morphology
David Kingsley: Sticklebacks as a model for evolution of development
- 10.40-11.20 Coffee
- 11.20-12.30 **Susan Lindquist:** hsp90 and evolutionary capacitors
Richard Lenski: Experimental evolution in a test-tube
Contributed talk
- 12.30-2 Lunch and Posters
- 2-3.30 **Evolution of pattern and form**
Co-chairs: Vivian Irish/Jane Langdale
Enrico Coen: Flower development and evolution
Vivian Irish: Comparative analysis of flower development genes
Sean Carroll: Evolution of animal body plans
Contributed talk
- 3.30-4.15 Tea and Posters
- 4.15-5.15 **Jane Langdale:** Leaf origins and evolution
Michael Akam: Evolution of arthropod body plans
- 5.30-6.30 **Waddington Medal Lecture**
- 6.30-7 BSDB and GenSoc **AGMs**
- 7.00 Dinner

PhDs, Post-docs

We would like a couple of volunteers to write reviews of the Spring Meeting. To encourage you, we are offering £50 upon publication. Interested? Contact Andy Furley:

a.j.furley@sheffield.ac.uk

Saturday 23rd

- 9-10.30 **Larvae and life cycles**
Chair: Michael Akam
Linda Partridge: Evolution of size, life history and reproductive traits
Simon Conway Morris: Body plans in the Cambrian
Mark Martindale: Diversity of metazoan embryos larvae
Contributed talk
- 10.30 – 11.10 Coffee
- 11.10-12.30 **James Truman:** Insect metamorphosis
David Gems: Genes, ageing and longevity in nematodes
Detlev Arendt: The ancestor of bilaterians
- 12.30-2 Lunch and depart

For the latest details and for registration information see the BSDB or BSCB websites*:

BSDB: <http://www.ana.ed.ac.uk/BSDB/>

BSCB: <http://www.bsdb.org>

- * If web access not available, contact Victoria Milner, Procon Conferences Ltd, Ashbourne House, 2 South Park Road, Harrogate, North Yorkshire, HG1 5QU, United Kingdom. Tel: +44 (0)1423 564488 Fax: +44 (0)1423 701433

Future BSDB Meetings

The BSDB Autumn Meeting 2002
University of Nottingham, 16th –18th September

T-box genes in development

Scientific Organizers:
Jim Smith, Ginny Papaioannou

The T box family of transcription factors plays an important role in many aspects of development, including mesoderm formation and limb and heart development. This is the first meeting devoted to this important gene family, and it addresses evolutionary aspects of T box protein function, the structure of the T box proteins, T box specificity, and many examples of T box genes in development and disease. It promises to be an important and exciting meeting.

Confirmed speakers include:

David Brook
Jacques Drouin
Colin Goding
Janet Heasman
Bernhard Herrmann
Malcolm Logan

Christof Muller
Ginny Papaioannou
Gert Pflugfelder
Nori Satoh
Jim Smith
Alison Woollard

Spring 2003

Cell and Developmental Biology Annual Symposium
University of Warwick, 8th-11th April 2003

The title of this meeting reflects a new format, decided by a clear majority at a recent BSDB Annual General Meeting. Instead of devoting the entire meeting to one theme, as has been the practice in recent years, the Annual Symposium will consist instead of a number of half-day themes. We hope that this will encourage a broader range of researchers to attend, and that it will facilitate the exchange of ideas between fields. Each session will be organized by its own Chairman, who will begin the session by giving an introduction to the topic, and first-class speakers will then present research talks in the usual way. In the 2003 Annual Symposium, the topics will be:

- 1) Induction
- 2) Cell Fate and Differentiation
- 3) Organogenesis
- 4) Disease
- 5) Genomic Reprogramming

Further details will be presented in the next Newsletter.

Topics for Future Society Meetings

One of the major tasks of the BSDB Committee is to select topics to be covered in future meetings and then to ensure that these meetings are well organised and successful. It is obviously crucial that meetings are supported by the members of the Society, and we always welcome suggestions for future topics. If you have an original idea for:

- a half-day theme for the Spring Symposium,
- a two day Autumn meeting
- a one day workshop,

please get in touch with the **Meetings Secretary, Jamie Davies** (jamie.davies@ed.ac.uk)

Cell Biology and Neurobiology: A Meeting for Martin Raff

BSCB meeting
rescheduled from Sep 2001

University College London
July 3-5 2002

Martin Raff will retire from laboratory science this year and the scientific programme of this special BSCB meeting celebrates his career and his contributions to science. The programme reflects Martin's broad interests in **cell biology** and **developmental biology** as well as his current scientific interests in the neurobiology of behaviour, psychiatric disease, ethics, and science education.

This July meeting replaces the Sep 2001 meeting that was cancelled because of the terrorist attacks in New York and Washington.

General information, venue and travel

Please visit the web site at:

www.bscb.org

Information and registration will be handled by email at lmcb@ucl.ac.uk

Registration

Deadline for early registration—**May 5 2001**.

Posters

Posters are not being invited from delegates: instead the organisers have invited people who have worked closely with Martin over the last 30 years to submit posters giving an overview of their current research. Posters will also be provided by sponsors of the meeting.

Publication

BioMed Central will publish much of the meeting electronically.

Meeting charges

Full delegate £120

Student delegate £75

Meeting Dinner £38

Late registrant - add £35

Day rate £50

The fee covers teas/coffees, lunches, and evening drinks.

The Meeting Dinner will be on Thursday July 4 at the Hotel Russell in Bloomsbury Square.

Accommodation

Expotel Hotel Reservations are the official hotel and travel agency for this meeting.

Code: BSCB2001.

Tel : + 44 (0) 20 7372 2001

Fax : + 44 (0) 20 7624 4847

Email : events@expotel.co.uk

Embryos, Genes and Birth Defects

29 April – 1 May 2002

Course Directors: Professor Robin Winter & Dr David Fitzpatrick

Up to 2% of live-born babies have a major malformation, of either genetic or teratogenic origin. In recent years, there has been a tremendous increase in our knowledge of the molecular and cellular mechanisms underlying normal and abnormal embryonic development. This course will provide an update on this expanding research area, integrating laboratory-based and clinical approaches, and addressing the scientific foundations of many topical areas in the study of birth defects.

Intended for: Basic scientists, paediatricians, obstetricians, clinical geneticists, reproductive toxicologists, pathologists, and other professionals with an interest in congenital malformations.

Fees: £225 / £145 (students)

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Special Review of Teaching Texts

Review of the principle textbooks for undergraduate-level teaching of Developmental Biology:

- **Developmental Biology**, 6th Edition, S F Gilbert (2000) Sinauer 0-87893-243-7
- **Essential Developmental Biology**, J Slack (2001) Blackwell Science 0-632-05233-3
- **Principles of Development**, 2nd Edition, L Wolpert et al., OUP Current Biology (due 12/01)

Overview

From the point of view of the teacher, the delivery of Developmental Biology represents a daunting challenge. In most degree programmes the subject is marginalized. It rapidly gains a poor reputation with students and often fails to attract middle-achievers, who are the ones which benefit most from good literary presentation in their textbooks. The content of developmental biology is immense. It touches on (and purporting to explain) evolution, reproductive biology, and the life cycles of animals and plants. It requires students to grasp concepts as well as facts. Worst of all, it is no longer covered in the 16-19 education sector (except in a few enlightened curricula such as Salter/Nuffield A-level). So students come to university completely unprepared for the topic. It is against this background that three textbooks have emerged, which are likely to become the mainstay resource of education at undergraduate level in Developmental Biology. Each attempts a very different approach to overcoming these problems- making the subject come alive on the page, leading students systematically through it, providing a valuable learning experience through imaginative publishing media - and all at an affordable price!

Slack - Essential Developmental Biology

This 300-pp paperback volume states that it is intended for teaching support to undergraduates, covering all levels of a 3-year undergraduate programme. It avoids emphasizing concepts and the inclusion of historical background. It is an abbreviated guide to the subject, with 20 chapters on the essentials of Developmental Biology. All of the material is relevant and current, and there are no superfluous chapters on which teaching of the subject could not be based. Some topics are insufficiently covered (for example fertilization, which has a whole chapter in Gilbert, receives half a page and one figure in Slack. Mammalian embryogenesis and placentation are excluded). But others, such as stem cells and the importance of zootypes to evolution, are covered prominently and it is hard to find high-level treatment of the topic in Wolpert or Gilbert. All of the illustrations are black and white line-drawings, and can be downloaded from the publishers' website to be used for lecture overhead transparencies/handouts. The ratio of text to illustrations is higher than in the other two books, and the balance is rather poor in places. A very direct and colloquial style is used at the start of the book, which is desirable for students being introduced to the subject. However the introduction to molecular development is delivered below the required level for a Biochemistry undergraduate for example. The use of bold type for new words and the itemization of topics such as signal pathways, the cytoskeleton, adhesion mole-

cules, transcription factors and morphogen gradients make referencing simple.

An investigative and practical rather than predominantly factual approach is a feature of the book from the start. It reviews developmental biology by covering, systematically and in depth, the major model organisms. This approach, which is evident in Jonathan Slack's earlier books, helps to focus on the experimental value of each organism in turn and to base the learning experience on discoveries rather than concepts. There is a clear flow of information, and a simple account throughout, on the relationship between gene expression and function. Slack succeeds in giving a uniquely plain-talking and essential guide to the subject in the form of an inexpensive paperback handbook.

I will certainly teach from this book and would prefer to use its very direct approach for one or two topics which are unnecessarily complicated in Wolpert and Gilbert. I would recommend it for library but not for compulsory student purchase.

Wolpert - Principles of Development

The simple and lucid presentation of this book is its strength. The glossary of terms is a great help to uninitiated students. Unlike those of many undergraduate textbooks, the illustrations have been drawn with the educational experience in mind. Although, by comparison to Gilbert, illustrations in places are a little sparse and the three-colour presentation of explanatory diagrams becomes a little monotonous, their design is good. Throughout the book, there is a sense of time in development. This is reinforced with the use of temporal flow-diagrams, arrows and lifecycles. Magnified windows give the impression of scale changes and the uncluttered presentation of each figure delivers its message effectively.

In many respects Wolpert differs from Gilbert and other less widely used textbooks of developmental Biology (including Browder and Kalthoff), particularly in placing morphogenesis of the whole organism centre-stage from the start. This is a bold approach and, in my view a difficult one to adopt. Students are brought up on the biology of DNA and the cell, and the traditional 'cell-upwards' approach to understanding multicellular development is a better way to build on existing educational backgrounds. Nevertheless embryology is a forgotten science for undergraduates and there is a good case for bringing it back into fashion in the age of the genome by placing the whole animal (or plant) first and foremost.

Readers unfamiliar with the Wolpert approach will need to read the first chapter slowly, because important topics such as growth and allometry are covered in some depth here as well as later. Also included are some rather unhelpful analogies and concepts which are difficult to relate to the subject. The chapter following covering 'model organisms' is very brief compared to the 110-page equivalent section in Slack, where a more thorough, advanced and experimental approach is applied.

The main theme of the book is to provide a new look at tissue-specification from the animal down, and similar material is hard to find in both Slack and Gilbert. The chapter on *Drosophila* is an excellent one to teach from, and is much superior to the tortuous equivalent in Gilbert, with its 'Cartesian coordinate model' and 'realisator genes'. The chapter on plants is excellent, inspi-

rational and well ahead in its field. By comparison Gilbert contains an 'overview' of plant development which is almost entirely composed of traditional morphology and almost no genetic analysis. Gastrulation is presented entirely from the point of view of morphogenesis, cell movements and cell recognition. Inductive events, which have already been covered are sidelined here, and there is a rather artificial separation of the two topics

Elsewhere, comparisons of Gilbert and Wolpert find good points in both. The topics of sex determination and germ cells are parcelled up into a rather short (25-page) section in Wolpert. By comparison, there is a lavish (40-page) coverage in two chapters of Gilbert. In contrast, the chapters in Wolpert on regeneration (where else would you learn and remember the definitions of morphallaxis and epimorphosis!), growth and evolution are all very good. The Gilbert approach just doesn't seem to work for these conceptualised topics, and I would much prefer to teach them from Wolpert.

The second edition of the book has not changed substantially from the first. The most welcome improvement is an improvement of the almost unreadable font of edition 1, and the simplification of section headings. There is a trend, echoing that of edition 6 of Gilbert, of including text and figures which name more of the key genes involved in morphogenesis (catenins and notch in chapter 3, FGF-8 in 10, slit and ephrin in 11) and describing signal pathways involved in cell recognition and induction in more detail. There are a number of welcome attempts to clarify concepts in parts of the book. Chapter 3 is now clearer on the comparative basis of body axis specification in vertebrates. Chapter 4 contains a longer and improved explanation of somite generation and differentiation. A reorganized chapter 9 deals with the relationship of gene expression to cell differentiation in a more simplified way. There is a very welcome addition of material highlighting functional differentiation of a range of new vertebrate tissues and structures in chapter 10 (the vertebrate heart and vascular system, lung and tooth, with skin development moved forward from chapter 14), whilst more is included on arthropod neuroblast and compound eye development in chapter 11. In the final chapter, new pages are added to support the section on phylogeny and functional morphogenesis in evolution, including storylines on snakes and kiwis. There is also a discussion on variable growth rates in homologous structures and the evolution of the gastrula. This is all material which makes this book an increasingly attractive resource for students enthusing about the relationships of development to evolution - something which really does get them going!

With the inclusion of new teaching support materials, Wolpert can be used as an all-sufficient textbook for students at first and second year level.

Gilbert - Developmental Biology

The advantage of this book, both from the point of view of teaching and marketing, is that it has stood the test of time and beaten off competitors over more than a decade. Gilbert has seen the subject change its content and emphasis. In six editions, which have sometimes been turned round at breathtaking speed, he has kept up to the trends and pioneered the educational delivery. Major changes in layout, structure, content and size have been features of some of the recent new editions,

and all of them are clearly based on Gilbert's unique view of the subject, supported by an excellent production team at Sinauer, by all accounts.

The quality of presentation of editions 6 (published Summer 2000) is without parallel, and the combined use of the textbook, CD-ROM and website have certainly revolutionised my teaching and my students' appreciation of Developmental Biology. This edition follows Wolpert edition 1 by 2 years, and the major changes which have been made to edition 5 are clearly designed to give it the competitive edge. The change to 2-column format has reduced the length from 950 to 750 pages, and the use of lighter paper makes the book slimmer by 30% and rather less ponderous-looking, although the number of chapters has been reduced by only one. The colour plate section has been removed in preference for an all-colour spread. The most significant aspect of the book's production quality is in the figure presentation. Plentiful illustrations are well-balanced with the text. A large variety of content: half-tone black and white, full colour photographs and light micrographs, scanning electron micrographs, numerical data and graphs, cartoon diagrams, some on a black background, etc. provide a visual feast for the reader on the majority of two-page spreads. Skillful rearrangement and rewriting of many of the chapters means that cells, whole animals, chromosomes and genes are interwoven in a completely holistic approach to the subject, in stark contrast to the more disjointed approaches of the previous two editions.

The approach of Gilbert is one of contemplation and exploration. The book starts with questions (in contrast with Slack which starts with the answers - the impact and applications of developmental biology). In the first chapter, typical of his scene-setting approach, Gilbert brings together history, evolution, comparative Zoology, cytology, experimental techniques and maths - all in 20 pages! The book works up from animal and plant life cycles, working to students' frames of reference from secondary education. Practical techniques, as in Slack, are placed into a chapter of their own.

The book should now appeal to more mainstream biology students. Invertebrate animals - in a new chapter - are considered in their own right and not as 'model' organisms, and the section on vertebrates has been extended to include fish. However all of the important players in experimental embryology are considered, including echinoderms and ascidians, which Slack excludes presumably because their contribution to the subject is more historic than that of other animals. Although the pace of review and revamping between issues is relentless, some chapters (such as the one on amphibia) are in need of updating next time around.

The main disadvantages of this book continue to be ones of style. Chapters come and go and major rearrangements take place in Gilbert's Developmental Biology, but some idiosyncracies remain to be expunged. Its organization still needs improvement and focussing. One chapter assembles the unlikely combination of metamorphosis, regeneration and aging, and for no apparent reason other than they belong nowhere else. Others have titles which give no clue as to the content: like the 'Saga of the Germ Line', which one discovers on careful reading is about germ plasm segregation and the routes of germ cell migration. The continued inclusion of 'Sidelights and Speculations' is the most irritating aspect of the book's layout. Gilbert enthusiasts

Special Review of Teaching Texts

hoping that these 'stop-press' snippets of information would all be drawn into core text by edition 4 will, no doubt like me, suspect that there is a self-regenerating cycle which means they will never stop appearing in new editions. I find they disrupt the flow of the book. The student is entitled to ask 'are they important or not?'. Now that the website carries extension material, is it not important to focus the textbook on essential/core material? Readers would benefit from a clear summary statement, rather than being left trailing off at the end of each chapter into a twilight zone where the ragged edge of current research legitimately be-

comes worryingly enigmatic to the earnest second year undergraduate.

Having used Gilbert for some time, I have had the opportunity to critically compare my only resource with two new and attractive alternatives. I find there are advantages to all three books and would advocate a careful read before you take the step of elevating one to your students' compulsory reading list!

Laurie Haynes, PhD
Senior Lecturer
School of Biological Sciences
University of Bristol

Book Reviews

Mechanisms of Cortical Development

David J.Price and David J.Willshaw.
Oxford Science Publications –
Monographs of the Physiological Society 48 / 2000
ISBN 019262427X £69.50

I have been inordinately slow in producing this opinion, due to various circumstances that kept distracting me. Nevertheless, I have had frequently this book in the hand and have perused each part of it two or three times, at least. This was to my advantage, since it is a singularly useful book, as it would be for the simply curious young neuroscientist or other researchers not working in the cortex.

Commonly, neuroembryological books and reviews tend to concentrate on the earliest, better understood periods of development, when not delving on specific developmental processes and related molecular stuff. It is rare that a single brain region is covered thoroughly, with side glances at all the various aspects that may attract our attention. Price and Willshaw have come up here with a very reasonable overview of current knowledge on mechanisms governing the developing cortex, guiding the reader from the earliest cortical primordium to the fully connected cortex and its functional plasticity. Emphasis was placed throughout on developmental mechanisms, rather than on descriptive aspects. In so doing, the authors explain the basics of numerous cellular and molecular sets of data relevant for such an overview, sometimes also taking into account experiments on other parts of the brain or obtained in non-mammalian species. There is thus a wealth of synthesis in this work, so that the reader must have a truly encyclopedic knowledge of the field in order not to learn something useful in every chapter.

The work is organized in six parts, leaving apart the introduction: 1) early development, 2) molecular regulation of early forebrain and cortical development, 3) guidance of axons and afferent innervation of cortical structures, 4) map formation, 5) mechanisms controlling cortical connections, and 6) functional development. These chapters introduce us to each of these subjects and aptly review relevant experimental and theoretic literature up to a given point (1999). Some rapidly moving issues obviously escape from complete coverage. The most sensible aspects I detected in this regard was the relative importance attached to thalamic input for cortical regionalization (less now than before

publication of the book) and the analysis of the tangential migration of cortical inhibitory interneurons and/or progenitors as coming from various parts of the subpallium (but the phenomenon is mentioned in the book). This last process, hitherto unsuspected, redresses the old key assumption that all cortical cells are produced locally, and probably serves to explain why classic approaches based on radial analysis of autoradiographic cell birthdays, or of clonal properties of retrovirus-labeled cell cohorts, included aspects difficult to interpret and often led to inconclusive results. The potent novel *lacZ* methodology for the study of neural clones unfortunately just escaped entering into the book.

There are a few errors or omissions I detected, which should not confuse the reader excessively. In p46, 'mitigate' probably means 'militate'. In p59, the gene *Nkx2.1* is said to be expressed in the striatum, but is in fact restricted to the pallidum and other telencephalic stalk areas. In pp91-92, cortico-claustral connections are not mentioned (the claustrum is the cortical Cinderella). In p119, somatosensory 'barrels' in the skin are said to be projected 'via the midbrain' to the cortex (probably means via the dorsal thalamus, if a synaptic relay is implied). In p123, the part b of Figure 5.3 is apparently wrong, since in all vertebrates nasal retina projects to caudal tectum and dorsal retina projects to ventral (lateral) tectum; both axes of visual representation are inverted. A comment on 'slight evidence for complementary labels in retinotectal connections' in p171 bears on a rapidly moving field, which interested readers should explore elsewhere: the role of ephrins and ephrin receptors as complementary labels involved in topographic ordering of retinal projections (these types of molecules are expressed also in the cortex, but I am not aware of specific studies on their role there yet).

On the whole, this book covers brilliantly its aims, providing within a manageable size a wide introduction into the various mechanisms of cortical development, visiting the anatomical and histogenetic aspects, the families of molecules involved, the theoretical models postulated and the most relevant evidence, critically analyzed. Most researchers on the developing cortex in general delve in one of the topics covered in the book, which accordingly provides a very convenient source of wider perspective and complementary information and lines of thought for the specialist. Moreover, many of the developmental processes presented here can be

extrapolated *mutatis mutandis* to other brain regions. Persisting interest in understanding the cortex has served as an attractor for all sorts of approaches. This book serves as an example of the type of treatment one would want to have as a background for attacking developmental issues in any part of the brain.

Luis Puellas, Univ.Murcia, Spain

Successful Scientific Writing

JR Matthews, JM Bowen and RW Matthews
Cambridge University Press
ISBN 0521789621 £15.95

This was one of the most enjoyable and informative books that I have read in recent years. Primarily it is aimed at those writers who are hoping to have their scientific work published for the first time. However, it is also a must for all undergraduate and postgraduate science students. The authors have the ability to convey, in a user-friendly way, all the stages that are needed in order to write any scientific work, from an essay or dissertation through to a full journal article. The book is well organised, allowing the reader to pick and choose sections that are most suited to their individual needs. There are chapters on literature searching as well as those with useful techniques in organising and planning the content of your written work. Other chapters give advice on every stage of writing from the first draft to the final version, including when and where to use tables and figures and importantly chapters on everybody's favourite grammar and punctuation. I know that I will refer to this book frequently throughout my time as a PhD student and onwards into my scientific career.

Elaine Hemers, Liverpool

The Coiled Spring: How Life Begins

Ethan Bier
Cold Spring Harbor Press, 2000
ISBN 0-87969-563-3

When we attempt to reach out to a more general audience, the language and style we use to couch explanations in developmental biology can be revealing and insightful. At the same time, our choice of metaphor or comparison may intrude upon successful communication between a scientist writing about their field. The author, Ethan Bier, is a successful developmental geneticist working on the spatial patterning and boundary effects that are in action in the epithelium of the wing disc of *Drosophila*. Although in the preface, he explains that "now is an opportune time to provide the general science reader with an account of the rapidly unfolding field of developmental biology", I do not think that he achieves it. However, despite his metaphors, included the one in his title, this book is very suitable for other readerships including undergraduates, who wish to *study* this area.

Bier makes a deliberate choice to limit his presentation to three areas, *Drosophila*, several vertebrates and green plants, and in each of these areas he devotes one chapter on the establishment of embryonic axes and one on appendage formation. The book has two initial chapters, one called The Central Dogma of Biology, dealing with differential gene expression and multipotency of nuclei in somatic cells, and the other explaining molecular methods of analysis now in use. The ninth and final chapter examines The Future of Biology

and Man, including the social impact of this science, the human genome project and human health, and genetic engineering. In the core central six chapters, his "developmental vignettes", Bier describes classic experiments as well as cutting-edge contemporary research. These six chapters are a backbone for a short and circumscribed but quite advanced course in developmental biology. Students with some biology background could start at chapter 3. I will describe chapter 4, entitled Patterning Fly Appendages and Eyes, citing examples to illustrate the organisation common to all six core chapters. Each chapter has a "Cast of characters" at the beginning, including terms (compartments, organizers), and genes (for instance, twenty one genes including *bride-of-sevenless*, and *spalt*), and ends with a summary statement. 'Boxes' of information interrupt the text (the Double role of Dpp signalling, The Sevenless Story). The illustrations in each chapter are diagrams, but there are four full-page colour plates together in the centre of the book, containing colour photomicrographs (including *dpp* and *sal* expression in the wing disc of *Drosophila*, and a wing showing ectopic expression of human *pax6*).

Interspersed in the chapters, are profiles of seventeen developmental biologists (the list includes Gurdon, Garcia-Bellido, Mangold, Goethe and Meyerowitz). I am used to the often rather bland personal sketches of scientists one finds in larger textbooks. Bier had asked each scientist a common set of questions, and these "bioboxes" are very informative and fascinating because they reveal insights about the intellectual approaches of the profiled scientists. As an instance, I commend his profile of Cliff Tabin, which conveys the excitement and also the stress and anxiety of research.

The "general science reader" who reads this book will have to feel happy with the information-dense and precise style in which biological scientists write for each other. For instance, I am unlikely to be giving a copy of this book this Christmas to my brother-in-law, who is a graduate computer scientist/physicist employed in the financial world (though he already has a shelf of well-read other books from me, including ones by Dawkins, Feynman, and Pinker). Whilst the arguments and detail are made very clear, in many places, the language often remains as complex as it is in the primary journals familiar to us. Will the general science reader cope with "enzymes such as ATP synthetase involved in energy metabolism" (p23), "patterning genes" (p23), "DNA binding sites" (p 25), "default state" (p29) or "the lateral neuroectoderm". What reinforces my impression that this is not for the general science reader is the list of References and Further Reading. It will be a well-financed public library that has subscriptions to Cell (over twenty references), Development, and Genes and Development. Perhaps I should regard this as correct source documentation, because there are also listed several useful URLs, and some more accessible texts. The Glossary is good, with the exception that the Wellcome Trust might be miffed at reading the definition by an American scientist of the Human Genome Project as "a major national initiative...!"

And so to metaphor and simile! "The coiled spring" implies that the development of an organism is like a clockwork machine or perhaps an animal trap that has been cocked. This title may be eye-catching in a publisher's list or on a book stand but is the rather non-specific triggering of release of potential energy a

helpful analogy for developmental processes? In this text, there are also analogies between cells and computers: that different cytotypes are like computers using different software applications. We use metaphor in our everyday speech often without noticing it. More generally, in the context of explaining development, difficulty and confusion can arise if the comparison is with a familiar process or object, which may simultaneously bring into the reader's mind all manner of other 'baggage'. A deliberately chosen metaphor has to refer to some more familiar and understood item to be more useful than as a brief conceit. I may be carping now, because Bier certainly transmits well the message about the discovery in widely different species of conserved common mechanisms and genes, and he emphasises the evidentially-based nature of this science.

What category of book? The Coiled Spring sits on my bookshelf with *From DNA to Diversity*, by S B Carroll, J K Grenier and S D Weatherbee (2001) Blackwell Science, which I regard as excellent (and different in scope from Bier's book), *The Making of a Fly* (1992) by P A Lawrence, also Blackwell Scientific, and with *Life without Genes* by A Woolfson (2000) Harper Collins. I offer them all to curious enquirers who call in at my office.

Robert Whittle, Brighton

Neuronal Growth Cones

Phillip R. Gordon-Weeks
Cambridge University Press, 2000
ISBN 0521444918 £55

We are able to write this review and you are able to read it because the 15 billion or so neurons in each of our brains have connected to each other in a stereotypical pattern of staggering complexity. Each individual connection has been made during our development by the movement of cellular elements called growth cones from one cell to another. The navigational feats achieved by growth cones are often spectacular, requiring them to make numerous accurate turns over distances that are enormous when compared to their own size. Ramon y Cajal discovered and named growth cones in the late 19th century, using the analogy of a "living battering ram, soft and flexible" to describe them. Phillip Gordon-Weeks uses other analogies, to "a spider spinning a web or the laying of a telephone cable by a cable-laying ship", and describes the appearance of a growth cone as an enlargement at the end of a growing neurite with "fine, finger-like extensions". These newer analogies are satisfying given that we now know that growth cones possess remarkable autonomy from their cell bodies, retaining the ability to move and navigate even when their connection to the rest of the cell is severed. The implication that the growth cone is like a hand, exploring and interacting with its environment *via* motile finger-like extensions, becomes more profound if you suspend credibility and watch the 1946 film "The beast with five fingers", in which the prime suspect in a series of murders is a pianist's severed hand.

This book aims to provide a detailed treatment of our current knowledge of the neuronal growth cone and is intended for graduate students and more experienced researchers rather than for an inexperienced or lay audience. It is divided into five chapters, comprising a general introduction, a description of the growth cone cytoskeleton, axon pathfinding, intracellular signalling in growth cones, and a brief chapter on synaptogenesis. The book is primarily a compendium of 100 years of

experiments investigating growth cone function from their first description by Ramon y Cajal, analysis of their mechanical properties, and the more recent identification and characterisation of some of the molecules involved. The text is enthusiastically written and extensively referenced, containing a page of references for every two pages of text. The field of growth cone navigation is expanding very rapidly at present and a book such as this, which succeeds in drawing together and summarising the current state of knowledge, is certain to be of value and interest to those researching this topic. As Phillip Gordon-Weeks admits in the preface, the exponential increase in publications on the growth cone as he wrote the book subjected him to a 'Herculean task', and inevitably the downside of this being such an active topic of research is that aspects of the book will become dated quite rapidly. For example, the GTPases (Rho, Rac, and Cdc42) that regulate changes in the cytoskeleton in response to growth cone guidance cues are only given one page, the semaphorins are referred to by their old names rather than the nomenclature adopted in 1999, and the Robo/ Slit axon guidance system is described very briefly. Overall, the success of the book in consolidating such a large body of literature, describing current understanding that is unlikely to alter much, far outweighs the problems of omitting the latest findings. In fact, his approach has the benefit of giving the narrative a more rounded feel and does not confuse the reader with a mass of up to the minute data that has yet to fit into a clear picture. We are sure that many of those in or entering the field will consult the book for many years to come.

One aspect of the book is, however, quite disappointing: the figures. Even for the experienced reader, a greater number of figures would make for a more relaxing read. Where figures are present, they are often of primary data. Certainly, there are some striking pictures of growth cones that serve to illustrate points made in the text, but we were yearning for more summary diagrams to emphasise and summarise key points and to interrupt and provide a focal point for the often long tracts of text. Where diagrams are used, they are sometimes drawn with poor quality, a striking example being the very first figure of the book. Certainly, those who consult the book to find clear illustrations of sufficient quality for teaching will be largely unsuccessful.

In summary, this book provides a rich source of information on the experimental attack on the neuronal growth cone. It contains a comprehensive record of how people have thought about growth cones over the past 100 years, the sorts of experiments they have done to look at their behaviour, and a sprinkling of experimental anecdotes and original data. Each chapter, and sections within chapters, can be read in isolation making it a useful reference text. We would recommend it to anyone who, like us, is working on axonal growth and guidance and wishes to consult a single reference to deepen their understanding of what goes on in these tiny structures, whose 'sources of marvellous power by which nerve expansions make direct contact with far-off ... cells' first fascinated Ramon y Cajal 100 years ago.

Tom Pratt & David J. Price, Edinburgh

The origin of animal body plans: a study in evolutionary developmental biology

Wallace Arthur,
Cambridge University Press, 2000
ISBN No: 0521779286 £50

This is an interesting and intelligent book, which I enjoyed reading and from which I garnered a lot of useful information. Fundamentally, this book is a plea to Evolutionary Biologists not to ignore the important lessons that can be learned from Developmental Biology, particularly with regards the emergence of the animal body plans. The first few chapters concern themselves with explaining ideas behind evolutionary thinking, the concept of a body plan and the patterns of interrelationships between the metazoa. The next chapter deals with the central issue of this book, evolutionary developmental biology: where it came from and what its aims are. Chapters 5, 6 and 7 then look at particular cases in developmental biology to highlight some basic principles. The following chapters cover a discussions of the genetics of evolution and finally the book finishes with a reassessment of the relationship between ontogeny and phylogeny, and an identification of key area for future consideration. In each chapter, the author clearly states his aims and his arguments, and I think makes a reasonable case in each instance.

As I have hinted, this book seems to be primarily aimed at evolutionary biologists, and I suspect that any developmental biologists picking up this book would find much of it a hard read. That isn't to say that they shouldn't persevere, just that, while the developmental biology chapters of this book have been packaged for easy digestion, I don't think the same is true of the others. This is a bit of a shame, as this book should be generally read by developmental biologists, or indeed any scientist interested in evolution, as it is thought provoking and informative. I also think this book is overly long and could have benefited from some pruning. However, this is a minor criticism. This is a good book, and it is one that I will thrust upon any PhD student or post-doc who would be so wise as to join my merry lab and express an interest in evolution and development.

Anthony Graham, London

Endocrine Cell Culture

Edited by Stephen Bidey
Handbooks in Practical Animal Cell Biology
Cambridge University Press, 1998 (!)
ISBN 0521595630 £16.95

If you are thinking of moving into a new area of in vitro endocrine cell biology then this is the ideal manual to get you started. At first glance it's a slim volume, but it contains all the necessary detail to establish primary cultures from a wide range of endocrine tissues. Each chapter offers a comprehensive list of materials and reagents, a clear step-by-step protocol that covers every manoeuvre from start to finish, and a troubleshooting guide for what to do when things go wrong, as they often do with culture work.

A very welcome feature is the unusually high number of illustrations for a book of this type. These consist of a selection of simple but handy anatomical diagrams (e.g. where to find your bovine adrenal glands after the steer

has been sawn in half) and a good number of photographs to illustrate both the dissected tissue and, most importantly, what your cells should look like if you've succeeded in establishing the correct culture.

Anyone who works on a reduced budget will appreciate the money-saving tips such as when and how cell culture materials can be recycled. I also liked the personal touch of some authors, who balanced 'we use this protease because....' with 'some colleagues say they get good results with....'.

Best of all, this book succeeds, in only a few pages, in pre-empting many of your questions by going beyond a 'how to' approach and giving you a surprising amount of 'why this bit is important'.

Crystal clear cell culture advice. You'll want to wrap it in plastic and keep it on the lab bench.

Gareth Cuttle
Univ. Federal de Santa Catarina, Brazil

Two-hybrid systems: methods and protocols

Edited by Paul N. MacDonald
Methods in Molecular Biology series,
Humana Press
ISBN: 0896038327

When Stanley Fields and co-workers came up with the idea for the yeast two-hybrid assay, a means for detecting protein-protein interactions, the project was initially denied funding on the grounds that the review panel could see no possibility for commercial development of the idea. Fortunately, another source of funding was found and since then the system has become the predominant means of identifying protein interactions, largely replacing traditional biochemical purification and expression cloning strategies.

An ever-increasing number of laboratories are adopting the system and the aim of this book is to combine the various methods and protocols needed by researchers who are using the system for the first time with discussion of more advanced aspects of two-hybrid screening, such as the elimination of false positives and verification of interactions by in-vitro assays. It also deals with modifications of the original technique, including the split-hybrid (reverse two-hybrid), one-hybrid (detection of protein-DNA interactions) and three-hybrid assays.

The book is divided into four sections. The first consists of several chapters that deal with general methods used in the yeast two-hybrid assay, such as high-efficiency transformation and strategies for isolating plasmid DNA from yeast. It also includes chapters on the growth and maintenance of yeast together with an overview of common yeast strains and plasmids used in the assay, which will be of particular value to those who are just beginning to use the system.

The second section begins by addressing the problem of false positives in two-hybrid screens. The characteristics of the bait protein that affect its suitability are briefly discussed, together with methods designed to reduce the incidence of false positives during screens and to eliminate those isolated. This section also contains chapters that describe the use of GST pulldowns and coimmunoprecipitation with epitope-tagged proteins to verify interactions.

Book Reviews

The third section contains specific examples of the use of the yeast two-hybrid system that aim to demonstrate its ability to detect interactions involved in a variety of biological processes, such as transcriptional regulation, translation initiation, and apoptosis. However, two of the four chapters in this section add nothing but subtle variations of protocols described earlier in the book. The often lengthy introductions to these chapters, detailing the molecular mechanisms being investigated, are unnecessary in the absence of any real discussion of either the results obtained or the usefulness of the two-hybrid assay as a means of investigating these mechanisms. Of the remaining two chapters, the description of the analysis of multiple interactions occurring in the translation initiation process is a good example of how the other chapters should have been written.

The final section deals with modifications of the two-hybrid technique that have greatly increased the number of potential applications. The modifications described include the mammalian two-hybrid assay, the split-, one- and three-hybrid assays, and two membrane recruitment systems (Sos recruitment and Ras recruitment). These chapters are detailed and comprehensive descriptions of the techniques, and include the protocols used in these modified assays.

Although the book suffers from a lack of clarity in places, and from a high degree of repetition of basic information due to its format, it collects together detailed information on all aspects of the technique and will be a valuable resource for anyone who is using, or thinking of using, the two-hybrid system.

Chris Showell, Sheffield

Translational control of gene expression

Ed. Sonenberg, Hershey and Mathews.
CSHL Press, 2000
ISBN 0879695684 \$115

I guess I should have looked up the word "monograph" in the dictionary before offering to review this book. I was under the vague impression that it meant small slim volume, whereas I know now that it means "on a single subject", which in this case runs to well over 1000 pages. So, rather than give a detailed description of every chapter, I shall try to convince you what an important book this is, even if just to dip into. Overall, it is a very uneven book- lively and fascinating at times, turgid at others, but it is hard to see how this could have been avoided in such a wide-ranging, multi-author volume.

Chapter 1 (by Mathews, Sonenberg and Hershey) seems a good place to start. This chapter should be required reading for anyone with an interest in gene expression, from undergraduate level up. I found it fascinating, unfamiliar as I am with the historical background of translational control, and it really brought home to me what a transcription-o-centric world I (and I would guess most geneticists) work in. This chapter, although it gives a historical perspective, is also impressively up to date and serves as a very good scene setter for the rest of the book. This chapter, like the others, made me realise what an enormous amount I have to learn, in spite of the fact that I stumbled into the world of translation elongation several years ago now (through a positional cloning project) and have read what I thought was a lot in the field since then. Other,

later, chapters give a real sense of the great number of levels at which post-transcriptional regulation of gene expression is possible, from the differential rates of translation initiation of different mRNAs, to the length of the 5'UTR; from the synergy between 5' and 3'UTRs to the role of the polyA tail in ribosome recycling. It is humbling to read in chapter 2 (Hershey and Merrick), for example, that we lack the ability to generate computer predictions of mRNA structure; the availability of sequence of the human genome is so clearly only the first step. It is clear that an understanding of regulation of gene expression at the level of translation will also contribute enormously to the debate on how humans can be so complex with only 40,000 genes.

Many of the later chapters are quite heavy going. As a geneticist, I really missed the presence of mutational analysis; so many of the advances in the field have been based on biochemical analyses that for me the style was quite dry. I would like to single out chapter 4 (by Richard Jackson) for special praise here; this was really refreshingly lively with some really nice turns of phrase. One also got a glimpse into long running controversies (ribosome scanning, for example), which always liven up a book! On this point, it is a pity that the latest evidence of translation within the nucleus came out too late to be covered by this book.

Chapter 7 (Translational control of developmental decisions by Wickens, Goodwin, Kimble, Strickland and Hentze) is probably the chapter that will be of most interest to BSDB members, and luckily it was excellent. There is very little coverage in the book of synaptic translation, but what there is is well written and interesting (chapter 27 by Joel Richter). Finally, I would like to recommend chapter 36 (Kinzy and Goldman), which covers non-translational roles of components of the translation machinery. This might appear to be a bit of an afterthought, but in fact it is a fascinating, erudite chapter that reveals yet more about translation and the channelling of the apparatus to particular subcellular localisations.

So, in general, the book is scholarly, with good cross-referencing, and is admirably up-to-date. Overall, however, reading this book made me long for a condensed more evenly written version for the general reader. It's an incredibly useful book to have available, but I wonder how many people will actually read more than a few chapters. I certainly feel there's a place for a shorter volume that would be required reading for anyone working on gene expression. Any takers?

Cathy Abbott, Edinburgh

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Blackwell Science

Principles of cell proliferation, Heath 0632048867 £22.50
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The main function of the BSDB Committee is to organise our meetings, from deciding on appropriate topics to arranging organisers and venues. If you have any ideas on topics for a good meeting, or on a good venue, don't hesitate to convey them to Jamie Davies (or another committee member). The officers of the society will be happy to answer any questions relating to their specific subjects.

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BSDB Logo Competition



BRITISH SOCIETY FOR DEVELOPMENTAL BIOLOGY

The winner of the competition to design a logo for the BSDB (see last issue) was Jeff Christiansen, who works with David Wilkinson at Mill Hill. Jeff's design polled more than twice as many votes as his nearest rival in a vote that took place among BSDB committee members at the Autumn Meeting in Oxford (details available from Andy Furlay on request). The simplicity and adaptability of his design clearly played a large part in eliciting a positive response from committee members representing a very broad-ranging discipline. Congratulations to Jeff who (hopefully) has already received his prize of £100.

Comments from Jeff on the idea behind the logo:

Here's a design that I've drawn up for the BSDB logo. The whole idea is that it is quite modular which should make it more flexible (The text box with the title for instance could be left on or off depending on the application).

I have also included both colour and black and white as I guess this would change depending on whether it would be on the website or on a letterhead.

I've tried to keep away from using a specific species so as to encompass the whole field (hence the generic looking embryo). The different colours are supposed to represent different model systems.

Jeff Christiansen, NIMR, Mill Hill, London. j-christ@nimr.mrc.ac.uk (sic)