British Society for Developmental Biology

Newsletter 6

(May 1982)

(I) FORTHCOMING BSDB MEETINGS

SEPTEMBER 6TH - 10th 1982 St. George's Hospital Medical school, London

1) 7th. Symposium of the BSDB : "Current problems in germ cell differentiation" organised by C.C. Wylie & Anne McLaren.

Provisional Programme

Tuesday 7th. September

"The establishment of the germ line" (Convenor: A.P. Mahowald)

A.P. Mahowald (Indiana)
L.D. Smith (Purdue)
E.M. Eddy (Seattle)

"The formation of the gonad" (Convenor: C.C. Wylie)

Janet Heasman (London)
Marjorie England (Leicester)
M.H.L. Snow (London)

Wednesday 8th. September

"Tumours of the germ line" (Convenor: C.F. Graham)

M.J. Evans (Cambridge)
P.L. Stern (Oxford)
R.A.J. McIlhinney (Sutton)

"Interactions in the early gonad" (Convenor: Anne McLaren)

Judith Kimble (Cambridge)
A. Jost (Paris)
Anne-Grete Byskow (Copenhagen)
Anne McLaren (London)

Thursday 9th. September

"Functional Interactions between germ cells and somatic cells (Convenor: R.M. Moor)

Mary Bownes (Edinburgh)
R.M. Moor (Cambridge)
R.A. Wallace (Florida)

"Gene expression in oocytes in relation to embryonic development"
(Convenor: J.B. Gurdon)

H.R. Woodland (Warwick)
E.M. de Robertis (Basle)
P. Hausen (Tubingen)
Y. Masui (Toronto)

2) Ordinary meeting of the BSDB, Thursday 9th. - Friday 10th September.
Parallel sessions of contributed papers on:

"Mammalian development and teratomas" Organised by M.H. Johnson and C.F. Graham.

"Molecular biology of the oocyte" Organised by Ron Laskey and Alan Colman.

Members are invited to contribute both papers and posters either in the ordinary meeting, or in the symposium sessions, whichever is the more relevant. ABSTRACTS should be sent to the meetings secretary : Mike Snow, MRC Mammalian Development Unit, Wolfson House, 4 Stephenson Way, LONDON NW1 2HE to arrive not later than 18th June.
There will be a large combined social and poster session at this meeting. Contributions on any topic are welcomed. Abstracts should be sent to Mike Snow. Prize(s) will be awarded for the best graduate student posters.

APRIL 19TH - 22nd 1983 NOTTINGHAM UNIVERSITY

Symposium 8 : "Metamorphosis" (2 days)
Symposium 9 : "History of embryology" (2 days)
Ordinary meeting : 1) Steroid receptors/gene action
2) Developmental Immunobiology
Meeting of the "amphibian workshop"

SEPTEMBER 13th - 16th. ABERYSTWYTH

Joint meeting with BSCB. Major topics will include: cell surfaces, cell matrices. Proposed associated sessions include: cell death, lysosomes, cell movement, limb development, cellular basis of morphogenesis.

MARCH/APRIL 1984 UNIVERSITY OF LEICESTER

Molecular biology of the chromosome (to be confirmed)
Developmental neurobiology
Development and/or molecular biology of insects.

SEPTEMBER 2nd - 8th. 1984 UNIVERSITY OF SOUTHAMPTON

European developmental biology congress.

(II) MEETINGS OF OTHER SOCIETIES

"10th Conference of the European Teratology Society"
31st August - 3rd September 1982
University Of East Anglia, Norwich.

Symposia will include: Model systems in teratology, Reproductive toxicity of industrial chemicals, neural tube defects, and Paternal factors in teratology.

Contributions are welcome for contributed paper and poster sessions.

For further information, write to: Dr. P.A. McAnulty/Mr. F.W. Ross, 10th ETS Conference administrative secretariat, Life science research, Elm Farm Laboratories, Occold, Eye, SUFFOLK IP 23 7PX. (Tel. Occold (037971) 491).

"VIIIth International Biophysics Congress"
29th. July - 4th. August 1984.
The British national committee for Biophysics has appointed a scientific Programme committee to draw up a suitable programme for the congress. The chairman of the committee would welcome any comments or suggestions for this international meeting. Please write to: Prof. W. Fuller, Dept. Of Physics, University Of Keele, Keele Staffordshire ST5 5BG. (Tel. 0782 621111)

"Evolution and the Development of Mankind"
26th-27th June 1982
A week-end symposium to assess the relevance of evolutionary theory, organised by the Institute for Cultural Research. Speakers: Professor R.J. Berry, Peter Brent, Dr. Brian Goodwin, Dr. T. Halliday, Richard Leakey, Mary Midgley, Dr. Robert Ornstein, Dr. David Sobel, Dr. Donald Symons. To be held at the Mount Royal Hotel, Bryanston Street, London W1. Registration fee: £40; registration at 9.30 a.m. Booking by cheque to: Conference Director, Dept. R, The Institute for Cultural Research, P.O. Box 13, Tunbridge Wells, Kent (Tel: 089 286 2045)

(III) MEMBERSHIP

On 20 May 1982, the Society's mailing list contained 497 names, including 318 in universities in the UK with more than one member (namely, Aberdeen (9), Aberystwyth (8), Bangor (5), Bristol (12), Birmingham (10), Cambridge (32), Dundee (3), Durham (6), East Anglia (2), Edinburgh (26), Essex (3), Glasgow (8), Hull (2), Keele (2), Leeds (7), Leicester (120, Liverpool (14), London (77), Manchester (3), Newcastle (5), Nottingham (8), Open (2), Oxford (32), Reading (3), Sheffield (2), Southampton (14), Strathclyde (2), Sussex (11), Warwick (8). 56 members work in research institutes located in the UK, while 55 members receive BSDB notices at their home addresses or are in institutions with only one member. Of our 68 overseas members, 26 are located in Europe (Belgium (1), Finland (1), France (3), FRG (8), Greece (1), Italy (1), The Netherlands (7), Spain (1), Switzerland (3)), while 42 are located outside Europe (Australia (3), Canada (12), Hong Kong (1), India (3), Iran (1), Jordan (1), Libya (1), Singapore (1), South Africa (1), Sudan (1), Trinidad (1), U.S.A. (16)).

Please do all you can to help the Society get well past the 500 mark, in particular, by encouraging non-members with an interest in developmental biology to use the membership application form which accompanies this Newsletter.

(IV) BOOK REVIEWS

It's strange how a global term like 'reproduction' can come to have such a restricted meaning. Apart from Jack Cohen's text, (Butterworth, 1979), modern books on 'reproduction' confine themselves to gamete production and its control. It has been open season on the subject recently, with several volumes having been received for review:-

"Essential Reproduction" by Martin Johnson and Barry Everitt. (Blackwell ISBN 0632004270)
"Intragonadal regulation of Reproduction" Eds. Paul Franchimont and Cornelia Channing (Academic Press ISBN 0-12-26580-0) £19.60.
"Functional Morphology of the Human Ovary" Ed. J.R.T Coutts. (MTP Press ISBN 0-85200-358-7) £19.95.

The last named is an interesting new diversion in the field. A compendium of papers (not, for once, the proceedings of a symposium) it attempts to correlated what is known about the structure and function of the ovary (largely gained from other mammalian species), with the clinical management of patients. It is divided into sections, including:- sexual determination, the ovary from conception to puberty, the ovary during reproductive life, the abnormal ovary, and the peri- and post-menopausal patient. The volume is well produced, the papers interesting and up to date, and it is highly recommended for clinical reproductive biologists, and preclinical teachers who wish to include much-needed reproductive physiology into their human embryology courses.

Another non-symposium collection of papers, "Intragonadal regulation of reproduction" brings together 20 articles devoted to the synthesis of controlling molecules within the gonad, which seem to regulate long range signals (e.g. by FSH) acting upon it. These range from LH receptor binding proteins through intragonadally derived peptide controlling molecules, to sperm and egg maturation

factors. Figuring the largest amongst these is "inhibin" (a gonad derived peptide which inhibits FSH synthesis by the arterior pituitary) to which five articles are devoted. The possible roles of these poorly characterised and as yet (by the time of publication of these volume at least) unpurified molecules in problems of fertility, and in contraception, ensures healthy sales of this volume, and continued interest in the subject by developmental biologists at large.

"Essential Reproduction" is an eminently readable book which aims to represent an integrated approach to the study of reproduction and succeeds in providing an extremely clear and well-written introductory text. The first four chapters are concerned with central features of mammalian reproduction, and in particular human reproduction; establishment of the gonads and of the two sexes, the production of gametes and sex hormones. The middle section deals with endocrine function of the gonads, the interplay with the CNS and the effect of these hormones on the body tissues and on behaviour in general. In the final chapter the events of fertilization and pregnancy are described and their endocrine mechanisms considered. The style flows easily from one chapter to the next, treating description and scientific data with equal clarity and referring extensively to tables of detailed and comparative information. Each chapter has a list of suggested further reading which is of a general nature and does not cite papers of individual authors. The book can be strongly recommended for medical, veterinary and science students of mammalian reproduction and anyone with a general interest in the field.

"In vitro fertilization and embryo transfer" Eds. E.S.E. Hafez and K. Semm.

1982. MTP Press. ISBN 0-85200-438-9.

This volume represents the proceedings of a World Conference on the subject held in September, 1980. For this rapidly moving field, therefore, publication time has been slow.

Anybody wishing to start a test-tube baby clinic on the side should undoubtedly buy this book. Thirty seven collected papers described in detail the collection of eggs and their insemination in a variety of other animals as well as humans. Embryo transfer techniques are then described in the last section. There is a (sadly brief) discussion on the ethical implications of these techniques in humans, and no discussion at all of their enormous economic potential in domestic animals. As well as its basic use as a laboratory manual of methodology, there is much to interest those who study the mechanisms of gamete interaction. It is fascinating reading, particularly for those starting in the field of mammalian early development, or who wish to devise student practicals on the subject.

"Neoplastic and Normal Cells in Culture." J.M. Vasiliev and I.M. Gelfand. 1981. Cambridge University Press. Developmental and Cell Biology Series 8. ISBN 0-521-23149-3. £36.

The authors state in the preface that the aim of this book is to describe and discuss comparative characteristics of the interactions of normal and neoplastic cells with their environment in cell cultures. Only fibroblastic and epithelial cell types are discussed. While the authors recognise the importance of relating cell characteristics in vitro, with those in vivo, their attempt to do so only highlights current lack of data on the in vivo situation. The book contains exhaustive descriptions of the properties of fibroblasts, epithelial and neoplastic cells but does not develop with clarity a comparison of the neoplastic and normal state. Although the authors state their aim is to define the principal unsolved problems, these problems are not clearly discussed. The book is, however, useful and informative for those interested in the culture of normal and neoplastic cells, and as a general reference text covering the state of knowledge on these cell types prior to 1979.

"Gene Amplification." Ed. R.T. Schimke. 1982. Cold Spring Harbor Laboratory. ISBN 0-87969-151-4.

This is the proceedings of a symposium held in October, 1981, and contains an interesting selection of up to date papers on various aspects of the phenomenon of gene amplification. The book is divided into sections on:- examples of gene amplification, molecular structures of amplified DNA, mechanisms of gene amplification, and chromosomal alterations.

This is a timely volume for developmental biology, for over the past decade, this subject has falled from grace as a general mechanism for regulating the expression of particular structural genes during development. The outstanding and well studied examples, or course, are the 18s and 28s ribosomal genes of oocytes of many species. However, these have usually been regarded as an evolutionary curiosity, not repeated in the development of somatic tissues.

However, more examples of amplification began to appear in microbiology and tumour biology from studies of drug resistance or mutants which reduce the catalytic properties of a particular enzyme. For example, methotrexate resistance in certain cell lines turned out to be due to the amplification of genes for the inhibited enzyme dihydrofolate reductase. Since then two developmentally regulated genes in somatic tissues have been demonstrated to show amplification, namely chicken actin genes, and drosophila chorion genes.

There is therefore the possibility that gene amplification will turn out to be a more general developmental mechanism (presumably acting synergistically with "promotor-mediated" transcriptional control) than once thought, and the subject is well brought together.

"Primordial Germ Cells in the Invertebrates." P.D. Nieuwkoop and Sutasurya. 1982. Cambridge University Press. ISBN 0-521-22189-7.

This volume is a companion volume to "Primordial germ cells in the chordates" which came out two years ago. Together, the volumes represent a comprehensive treatise of the available evidence for the establishment of the germ line in animal embryos.

Each chapter deals with a different invertebrate group, and describes first the distinguishing features of the group, a brief account of embryogenesis and means of reproduction, followed by what is known about the origins of the germ cells. For these descriptions along the book is extremely useful for students of invertebrate development.

Two major themes running through the book are; firstly the stage in the life-cycle when a recognisable germ cell lineage becomes apparent and secondly the mechanism whereby it is determined. The early appearance of a germ lineage quite apart from somatic lineages is regarded as "preformistic", whereas late appearance of recognisable germ cells is described as "epigenetic". Differences in these respects are regarded as fundamental, and are discussed with regard to establishing phylogenies within the invertebrates.

The main importance of this book is in the demonstration of how little we know of the germ line, and as a stimulus to some much-needed research on the subject.

"Biology of the Cell." Stephen L. Wolfe. 1981. 2nd Edition. Wadsworth Inc. California. 544pp. £8.95.

This second edition of a book aimed at the large market of undergraduate cell biologists manages to provide a comprehensive and integrated overview of most aspects of cell biology.

Important changes have been made in the new edition. Some topics have been updated or are new altogether: for example, more attention is given to cell interactions (adhesion, recognition, receptors, etc.), enzymes and their actions, and nervous conduction. The chapters on membrane structure, respiration, photo-synthesis, nuclear structure, transcription, protein synthesis, DNA replication, cell division, and the cell cycle have all be updated; new chapters appear on transport and on the cell surface. Specialised topics (such as chromosome banding, recombinant DNA? lysosomes, mitochondrial and chloroplast genetics) are developed as supplements to relevant chapters.

Although such topics as gametogenesis and polytene chromosomes have been condensed, these are by now covered perfectly adequately in older standard texts. What this book offers is a very readable account of the major areas of cell biology, and the very latest developments in each. The illustrations are attractive and helpful, and in this last respect it is worth mentioning the appendix, which explains modern techniques with clarity and conciseness.

We have recommended this book as our course text for cell biology this year. At £8.95 it is a book which students will buy, and which represents excellent value for money.

"Metamorphosis: A problem in developmental biology." Eds. L.I. Gilbert and E. Frieden. 2nd Edition. 1981. 578pp. Plenum Press, New York and London. $47.40. ISBN 0-306-40692-2.

This is a curate's egg of a book - very good, but only in parts. For a completely new edition of a work first edited by Etkin in 1967, it is curiously conventional in its approach and rather backward-looking. There are few indications of any basis for the suggestion (p. 134) that "We are at the beginning of an era of exponential growth in the field". The introductory overview is certainly not the place to look, since it is an admitted rewrite of a 1958 essay, which though it may still have seemed cogent to its author, hardly sets the scene for a leap forward. Of the remaining 15 chapters, 6 are devoted to insects, 6 to amphibians, while two discuss vertebrates in general and one is a very categorical survey of all the invertebrate groups.

The chapters on hormonal control of insect metamorphosis (Granger & Bollenbacher) and Drosophila imaginal discs (Fristrom) are excellent, and that on chordate metamorphosis (Just, Kraus-Just & Check) provides an original and thought-provoking introduction to the vertebrate half of the book. White & Nicoll's review of the hormonal control of amphibian metamorphosis is useful, but they did not adequately deal with the problems that have been encountered in attempting to integrate thyrotrophin-releasing hormone (TRH) into the scheme of things. Atkinson's review of tissue regression is very good, but I thought that Fox's chapter on morphological changes omitted many major points, including the development of adult skin glands and a restructured lining of the alimentary canal during amphibian metamorphosis. I also failed to see the relevance of much of the contribution on biochemical characterization by Smith-Gill & Carver, which included a number of diagrams of the relative amounts of DNA, RNA, protein, carbohydrate, lipid and water in Rana pipiens at various stages of development, which seemed to contribute little to an understanding of metamorphosis.

I was very surprised to find no mention in the book of the immunological implications of metamorphosisfor immunocompetent amphibian larvae, no mention of pathology, mutants or goitres, and no adequate discussion of cellular aspects of the control of metamorphosis - do changes occur because of changes in the types or amounts of hormones in the circulation and/or because of the differentiation of surface receptors able to mediate responses to them? Finally, is metamorphosis just another problem in developmental biology or special unique one? There has been a great deal of emphasis on insects and amphibians, but would not many other invertebrates make good experimental material, and do not the preparations of developing reptiles and birds for hatching and or mammals for birth fall within the definition of metamorphosis (i.e. preparations for new environments, but not responses to them)?

"The thymus gland", edited by Marion D. Kendall. Symposium 1 of the Anatomical Society of Great Britain and Ireland. 1981. 218pp. Academic Press, London. £13.80. ISBN 0-12-404180-9

This first Anatomical Society symposium begins with a useful introduction (Kendall), which dispels many of the generally-believed half-truths about the thymus gland (e.g. that the adult thymus in man is atrophic), and suggests that the thymus is more complex and has a much wider range of functions than has hitherto been realised. The first part of the book is devoted to the comparative anatomy and evolution of the thymus (Manning), age and seasonal changes (Kendall), the ontogeny of the thymus in birds

(Le Douarin & Jotereau), where chick-quail grafts have been particularly useful, and the wide variety of cell types found in the gland (Kendall). Henry's review of the human thymus in disease is a helpful lead into a consideration of the functions of the gland, including hormone production (Dardenne & Bach), the range of epithelial cells which could have endocrine functions (Singh), and T-lymphocyte differentiation (Jordan & Robinson). The final group of chapters deal with pre-thymic progenitor cells (Sharp et al.), thymus stem cells (Yoffey), and regulatory humoral factors from the thymus and bone-marrow (Riches et al.). This book should stimulate others to become involved in unravelling unsolved mysteries about the development, structure and functions of the thymus, and gives the Anatomical Society's series a good send-off. If I had to make a criticism, it would be that 5 of the 12 chapters were wriiten by members of the same academic department.

"Of oxygens, fuels and living matter". Ed. G. Eemenza. Parts I and II.

John Wiley. ISBN 0-471-27923-4 (part I) and 0-471-27924-2 (part II).

£27.50 per volume.

All the important contributors to the field of biochemistry write highly personalised accounts of their work and the evolution of their particular subject. D. Mitchell, E.F. Hartree, P.D. Boyer, the Rochers, and F.B. Straub (Vol. 1). C. Martins, B.I. Horecker, H.G. Wood, A.E. Braunstein, J.S. Gruton, E.L. Smith and P. Karlson. Each article consists of an account of the author's scientific life, followed by reprinted versions of what they consider their key papers. Even those with only an undergraduate course or two in biochemistry can't fail to be fascinated to be fascinated by these accounts. If it weren't outside the mainstream of the Society's activities, the reviews of these would fill an entire Newsletter.

"Calcium and CAMP as synarchic messengers." Howard Rasmussen. John Wiley.

ISBN 0-471-08396-8. £29.25.

A very good single-author monograph whose central theme is that nearly every cell uses both Ca^{++} and CAMP in stimulus-response phenomena. Using a wide range of such phenomena from the effects of cholera toxin to smooth muscle contraction, the relationship between the two messengers is explored.

"Electron microscope of proteins". Ed. J.R. Harris. Academic Press.

Volume I ISBN 0-12-327601- 2, £35.00. Volume II ISBN 0-12-327602-0. £30.00.

These two volumes set out to review the progress achieved in the EM study of various types of protein (fibrous, soluble, membrane-bound etc).
Volume I includes haemocyanins, nuclear membrane proteins, intermediate filaments, coated vesicles, cilia and flagella, glycoproteins and protein synthesis.
Volume II includes multienzyme complexes, non enzymic proteins, bacterial appendages, plasma lipoproteins, connective tissue fibrous proteins and protein crystals.

"Fertilization and embryonic development in vitro." Eds. L. Mastroianni and J.D. Biggers. Plenum Press. ISBN 0-306-40783-3.

This useful compendium of articles concentrates on the various important aspects of in vitro studies of (principally mammalian) fertilization and early development. Initial attention is focussed on technical aspects of gamete recovery, followed by detailed consideration of biochemical and biophysical events associated with fertilization and early development. The emphases are on animal husbandry, and diagnosis and treatment of human infertility.

BRITISH SOCIETY FOR DEVELOPMENTAL BIOLOGY: APPLICATION FOR MEMBERSHIP

FULL NAMES (in block capitals) .....

TITLE ..... DEGREES .....

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I wish to apply for ordinary/student membership of the Society

SIGNATURE ..... DATE .....

Supporting signatures of two members of the Society:

1. .....

2. .....

Research interests of applicant .....

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Please return this form, together with the completed Banker's Order form (amended to allow for the appropriate subscription payment, viz. £4 for ordinary members and £2 for registered graduate students) to the Secretary-Treasurer:

Dr. Michael Balls
Department of Human Morphology
University of Nottingham Medical School
Nottingham NG7 2UH

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