

A short history of the British Society for Developmental Biology

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The British Society for Developmental Biology (BSDB) today is a very vigorous scientific society which holds two meetings per year. The Spring Symposium, normally held concurrently with a meeting of the British Society for Cell Biology, is a major international meeting of high scientific quality with an attendance of 500-1000. The Autumn meeting is a smaller affair with a limited number of foreign speakers and an attendance of 100-200, and is often devoted to a more specialised topic. The society has a high graduate student membership and enables many young members make contact for the first time with the best of international science. Everyone who comes to our meetings is impressed by the friendly and enthusiastic atmosphere as well as by the high quality of the science. In this regard, the BSDB has an advantage over some other British scientific societies, and over some developmental biology societies in other countries.

The early days

Although the BSDB has obviously benefited from the massive advances in developmental biology that have occurred during the eighties and nineties, its history goes back considerably further than that. In fact, it started its life in 1948 as the London Embryologists' Club. The initial meeting was a gathering of thirteen embryologists to found the club and was held at King's College London on 19th February 1948. The following aims were agreed:

1. Informal discussion of problems of embryology.
2. To provide opportunities for meeting embryologists from other countries.
3. In due course to form a sub-committee to explore the possibility of compiling a record of embryological research material available in this country.

Membership would be open to research workers and teachers of advanced embryology, and honorary membership would be offered to collectors and senior technicians interested in embryology. Meetings would be held three times per year in the University of London and would be preceded, where possible, by tea. The subscription was two shillings and sixpence (12.5p in today's money), but those intending to take tea before the meeting were required to inform the organiser in advance and were warned that a small charge would be made. An illustrated lecture on "The amniochorion of reptiles" was then given by Dr. Margaret Tribe and Mr. Alan Fisk.

Abbreviations used in this paper: BSDB, British Society for Developmental Biology; ISDB, International Society for Developmental Biology; JEEM, Journal of Embryology and Experimental Morphology; EDBO, European Developmental Biology Organization; IEE, Institut Internationale d'Embryologie.

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#Jonathan Slack was the Secretary of the British Society for Developmental Biology from 1993 to 1998.

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The second meeting was on "The limitations of amphibian material in experimental embryology" held on 4th June at University College London, and introduced by Mr. D.R. Newth (later Regius Professor of Zoology in Glasgow) and Dr. M. Abercrombie (later famous for his work on contact inhibition). The first president of the Club was Professor J.P. Hill, famous for the collection of mammalian embryos now reposing at the Hubrecht Laboratory in Holland. He was present at the second meeting and stressed the importance of the "establishment of an independent Embryology Department in every college of every university", an aim that seems rather ambitious even now.

The third meeting, on the 28th October 1948, was at University College and played host to a Dr. P.D. Nieuwkoop. He came from the Hubrecht Laboratory in Holland, a private foundation for descriptive, comparative and experimental embryology. The Laboratory was associated with the Institute Internationale d'Embryologie (founded in 1911) and through that body with UNESCO. He said that his Laboratory was interested in all problems relating to embryology including pathology, but that the main aim was the furtherance of embryology proper. The boundary of the science would alter with its development, and genetics was now an important subsidiary science. It was generally agreed that contact and cooperation between the Embryologists' Club and the Hubrecht Laboratory would be mutually beneficial. In April 1949, a committee member, Alan Fisk, attended a meeting of UNESCO in Brussels on behalf of the Embryologists' Club. Due to an administrative mix up, he was obliged to sign the statutes of the Conseil Permanent on behalf of the Institute Internationale d'Embryologie (now the International Society of Developmental Biologists) with which body he had no contact whatsoever. He was obviously quaking with fear at the possible consequences of this signature and wrote a lengthy memorandum to the committee on his return explaining how it had happened.

In addition to those already mentioned, early members of the club included Prof. G.R. de Beer (of "Embryos and Ancestors"), Prof. Danielli (of the lipid bilayer), Prof. W.J. Hamilton (of "Human Embryology"). In 1951 it was decided that life membership could be had for 30 shillings (£1-50 in today's money: an investment that was too good to be true, as became clear in 1964). At this time the "senior technicians and collectors" were reclassified as "associate members" to allow for the election of some more salubrious "honorary members".

The early meetings were held more often than originally envisaged, at the rate of about 6 per year. They were usually at University College London, an important centre housing the only department of embryology and anatomy in the country, although some were also held at Prof. Hamilton's department at Charing Cross Hospital Medical School (then in Knightsbridge). The format in those days was tea, followed by business, followed by a single paper and discussion, followed by dinner. The first 17 meetings dealt with these topics:

- The function of Hensen's node in development.
- Regeneration in hydroids.
- The influence of yolk on polychaete development.
- Studies in regional specificity in the amphibian organisation centre.
- The metabolism of cell division and cell differentiation.
- Experiments concerning development and regeneration in transplanted eyes of salamanders.
- The neural crest of the lamprey.
- Some biological problems in the mammalian ovary.

- Structural and functional aspects of the mammalian placenta.
- The development of *Clymenella torquata*.
- Aspects of polarity in plant embryos.
- The development of specialised sensory receptor areas in blood vessels.
- Experimental polyembryonic development of birds.
- Comparative gastrulation of vertebrates.
- The significance of the embryonic organiser.
- Aspects of lamprey development.
- The regeneration of the siphon of *Ciona intestinalis* and a general consideration of asexual reproduction in Ascidians.

The first Symposium was on January 7th 1952, on "Biological Aspects of Developmental Abnormality", it comprised 5 lectures and was obviously well attended.

The records of the early meetings reveal a catholic taste for the medical and zoological aspects of developmental biology, often sadly missing in our more specialised times today. They were well attended, figures of 22 and 60 being mentioned in early minutes. Speakers were sometimes members of the club and sometimes distinguished outsiders working in related fields or passing through London, such as E. Wolff, L.S. Stone, C.H. Waddington, P. Medawar, J.Z. Young, A.E. Needham, H. Grüneberg and Lord Rothschild. Many of these issues are, of course, still under active discussion today, such as the nature of the amphibian organiser. Many of the evolutionary topics have recently come back into fashion after a long eclipse (e.g., "The embryology of Myriapods in (sic) the problem of the origin of insects"). Others, particularly those relating to regeneration, are currently out of fashion, although I am pleased to say that the BSDB did hold a Spring meeting on Regeneration in 1996.

The first President, Prof. J.P. Hill, died in 1954 and does not seem to have been replaced in the office. In passing, it may be noted that the post of President never quite seems to have found a role. It was filled for a while in the seventies by David Newth (who had previously been Chairman for some years), Michael Abercrombie, and Anne McLaren, but was allowed to lapse from 1982, and was finally abolished by the AGM of 1995.

In 1954 the membership was 85 although "not all had paid their subscriptions". The prosperity of members was obviously satisfactory as after some meetings they were able to take dinner at the Garrick Hotel which cost 10s 6d per head. Prof. W.J. Hamilton's book must have been doing well as he apparently provided tea for the society at his own expense on several occasions. By 1959 the total assets of the Club had grown to £57-4s-8d, which the treasurer was empowered "to invest and reinvest as he saw fit". In 1960 a list was issued of a collection of reprints held by the Club. Of 44 titles, no less than 27 were in French and the rest in English, a ratio which hardly seems representative even for those days and probably reflects the influence of French and Belgian scientists in the Institute Internationale d'Embryologie.

IIE, JEEM and EDBO

This article is about the BSDB, and not about other developmental biology associations. However, I should briefly mention some of them to show readers that events in Britain were not occurring in a complete vacuum. The Institute Internationale d'Embryologie (IIE) was founded in 1911 by A.A.W. Hubrecht and dealt mainly with comparative vertebrate embryology and with the establishment of collections of rare, taxonomically isolated or primitive

mammals. It had a distinguished but restricted membership (Spemann wasn't let in until 1930) and held occasional small international gatherings. It was revived after the Second World War and had a close relationship with the Hubrecht Laboratory, which had been established in Utrecht, Netherlands in 1916. A number of exclusive international meetings were held both in Europe and in the USA. In 1956 it was decided to admit ordinary members and the organisation became more democratic. In 1968 it was renamed the International Society of Developmental Biologists (ISDB). In recent years it has had a membership of about 800 and organises a major conference every four years. The BSDB affiliated to ISDB from 1997.

The Journal of Embryology and Experimental Morphology (JEEM) was established in 1953, published by the Company of Biologists, with its centre of gravity initially at University College London and later in Cambridge. Apart from being an important journal, particularly in the area of vertebrate embryology, biennial *JEEM* conferences were held from the mid-fifties, arranged to coincide with an annual meeting of the editorial board of the journal. Some of these were in the United Kingdom and some in other European centres. *JEEM* became *Development* in 1987 under the editorship of Chris Wylie.

The European Developmental Biology Organization (EDBO) was established in 1978 as a federative European level body and took over the *JEEM* conferences from 1982. Relations between the BSDB and EDBO were never easy. On the EDBO side the BSDB (its largest national society) is seen as insular and Eurosceptic, while on the BSDB side there were continuing doubts about whether EDBO had a function, seeing as there were already other specialist international bodies such as the ISDB and the International Society of Differentiation organising meetings, together with a significant involvement in developmental biology by the European Molecular Biology Organization (EMBO) and the European Science Foundation (ESF). I remember attending the first EDBO meeting in Berlin in 1978 and giving a 6 minute talk. In those days I was blithely unaware of the complicated relations between all these international organisations. Eventually the BSDB committee decided that it could show some international commitment by affiliating to ISDB, and at present EDBO has been allowed to enter a "dormant state".

From Club to Society

Although the central dogma of molecular biology was rapidly accepted in the 1950s, and embryologists such as Needham, Brachet and Waddington had long been concerned with molecular mechanisms of development, the first mention of a macromolecule in a Society symposium title comes in 1960 with a meeting on "Development and DNA", which was attended by 90-100 people. The programme was as follows:

2.00	Replication and Development	Prof. Abercrombie FRS.
2.40	Biological macromolecules	Dr. S. Brenner.
3.20	Nuclear and cytoplasmic inheritance in Amoeba	Miss S.E. Hawkins.
4.00	Tea	
4.30	Architecture and information	Prof. C.H.Waddington FRS.
5.15	DNA in eggs and embryos	Dr D.R. Newth.

Assuredly, the Embryologists Club had entered the modern age.

In 1962 a Dr. Wolpert is recorded as having joined the committee as an ordinary member, and in 1963 Prof. W.J. Hamilton retired from the chairmanship after ten years and was replaced by Prof. D.R. Newth. In 1963 there were discussions about whether to

expand the Club from its informal and London-based form into a national society. This was put to the membership and agreed at a Special General Meeting held after the scientific meeting of the 1st January 1964. The existing committee remained in office as an interim committee. The rather over generous life memberships were then rescinded. The life members were offered either two years free membership of the new society or a refund of their money. The letter of invitation sent to "all biologists, anatomists, biochemists and physiologists whose addresses are known" included the following aims of the new society:

1. To bring together British biologists and other scientists who are interested in developmental problems.
2. To bring British developmental biologists into formal contact with their colleagues in other countries and with international scientific agencies.
3. To organise regular scientific meetings (at least three per annum) at which offered papers would be read to members. Such meetings would be held in provincial cities as well as London.
4. To organise informal short meetings on specialised topics whenever there is sufficient demand from its members.

The annual subscription would be 25/- (or £1 for those paying by Bankers order) with a student rate of 15/- available for three years only. Thus was born the "Society for Developmental Biology". The effort put into the launch was considerable, particularly on the part of the then secretary, Elizabeth Deuchar.

The inaugural scientific meeting of the SDB was held in Oxford on June 20th 1964 hosted by Dr J.B. Gurdon (now Sir John Gurdon). At the previous committee meeting it was decided to provide coffee, biscuits and tea free of charge to the participants, signalling that the financial position of the Society was sound. Dinner would be at the Clarendon Restaurant at 25/- and Dr. Gurdon expected that there would be sufficient vacancies at 4 hotels with prices ranging from 36/- to 48/-. There was also "a possibility of two or three men being accommodated at Christ Church College and a few women at St. Hugh's College". The programme was as follows:

11.15	J.B. Gurdon	The cytoplasmic regulation of nuclear activity in amphibian development.
11.45	C.W. Wardlaw	The scope and outlook for new work in plant embryology.
12.15	E.R. Huehns	Human embryonic haemoglobin: an example of biochemical development.
13.00	Lunch	
14.10	P.R.J. Burch and R.J. Burwell	Molecular basis of self recognition and mitotic control.
14.30	W.S. Bullough and E.B. Laurence	Modulation in adult mammalian tissues.
14.50	K.R. Ashby	The effect of steroid hormones on development of the reproductive system in <i>Salmo trutta</i> .
15.10	J.M. Ionnou	Oogenesis in the guinea pig.
15.30	R.M. Gaze, M. Jacobson and G. Szekeley	The neuronal connections formed by double nasal and double temporal eyes in <i>Xenopus</i> .
15.50	Tea	
16.20	P.R. Bell	The distribution of desoxyribose nucleic acid in the egg of a fern.
16.40	G. Webster	Changes in enzyme activity during pattern regulation in <i>Hydra</i> .

Much effort and many committee meetings had been expended on this programme. It is clear that the committee now felt that animal embryology was too narrow a speciality, and active efforts were being made to draw in other scientists with related interests. The programme was heavily oversubscribed and the committee selected papers intended to appeal to a wide range of interests. Their efforts were successful to a degree but, interestingly, efforts are still being made to bring plant developmental biologists into the Society. History seems to have proved that animal embryology is our core business and it can be difficult to expand much beyond this area of interest.

The second meeting of the SDB was held on November 21st 1964 at the National Institute for Medical Research at Mill Hill. The third meeting was in January 1965 in Cambridge, the fourth in June 1965 in Glasgow, and the fifth in November 1965 in Sussex. The early meetings had no grand theme or title, although the one at Glasgow embodied a symposium on "The Initiation of Cell Growth". By the AGM of 1965, the Secretary (the indefatigable Elizabeth Deuchar) could report that there were 186 members, of whom 52 were former members of the Embryologists' Club and 134 were new. The total expenditure for the year was £78-3s-4d and there was £110-0s-5d in the bank. Dr. Frank Billett, from Southampton University, became secretary in 1967 and continued a vigorous level of activity which resulted in the steady expansion of the society.

In 1966 it was noticed with some concern that the prestigious journal *Developmental Biology* was now to be "published under the auspices of the Society for Developmental Biology". It turned out that the Society for the Study of Growth and Development, founded in the USA in 1940, had in 1964 balloted its members with a proposal to change the name to "Society for Developmental Biology". This had been carried and the American society had changed its name in 1965. Despite the narrow priority of the British society, the Americans were unwilling to change their name as they were bigger (900 members) and considered themselves to be an international society publishing an international journal. After a period of dogged resistance, the British society eventually gave in and from 1969 was officially known as the "British Society for Developmental Biology".

In 1968 a joint meeting was held in Glasgow with the Society of Experimental Biology, and another in Oxford with the Society of Cell Biology. This featured a symposium on "The relationship of DNA synthesis to cell differentiation" thus marking a step towards the current policy of joint thematic meetings. This symposium was also noteworthy for featuring a prominent American speaker, Dr. D.D. Brown. At this time, speakers from continental Europe were a rarity and those from America almost unknown. The format of three meetings per year was adhered to until 1978 when it was reduced to two, one in the Spring and the other in the Autumn.

Maturity

Meetings continued in the same vein for some years, consisting mainly of UK speakers, usually with no overall theme, and running over two days. In 1971 in Leicester and again in 1977 in Birmingham there was a half day session on teaching materials (films, practicals, examinations). This is something that has been hard to pay serious attention to in recent years because the majority of active developmental biologists in the UK are now in special units

and institutes rather than being university teachers. When a very good "Teaching course" was run in Oxford in 1992, it was not actually addressed to university teachers, but to foreign postdocs from star laboratories.

In April 1975 the joint meeting took place in the Netherlands jointly with the Netherlands Society for Developmental Biology. This was a consequence of the close relationship with Dutch colleagues established over many years through the ISDB, *JEEM* Conferences and EDBO. In 1976 was the first big international meeting, also supported by the ISDB. It was held in Glasgow and was a symposium on "Vertebrate Limb and Somite Development". This was in fact the first developmental biology meeting that I myself attended, having moved into the field in 1974 and spent two years working on amphibian limb development in Lewis Wolpert's laboratory.

The programmes of the seventies tended to have a high content of mammalian development because of the preeminence of several British scientists in this area. This was the main theme in Cambridge in 1970, the London Hospital 1971, Nottingham 1976 and the London Zoo 1977. The number of foreign speakers gradually increased until in 1980 there were two international symposia, one in Cambridge on "Post-Transcriptional Control in Differentiating Systems", and the other in Southampton on "Development in the Nervous System". I remember making a brief dash to Southampton to attend the second in between my wedding and honeymoon. From about 1981-85 this pattern continued of both Spring and Autumn meetings being international, and sometimes both being published. In addition to the 2 day symposium which was necessarily thematic, there was also 1-2 days of contributed papers at each meeting which could be on a variety of subjects.

In the late seventies and early eighties, several symposia were published by Cambridge University Press as books. The first of these sold very well (2500 copies) but by the sixth, sales were down to about 500 and the policy was discontinued. This severe trend was not due to any decrease in quality but rather to the worldwide squeeze on higher education library budgets. From 1984 an alternative arrangement was made, of publishing the symposia as special issues of *JEEM*. This journal, like its successor *Development*, was not owned by the BSDB but by the Company of Biologists (CoB), which has published biological journals since 1925 and distributes its profits for the benefit of biology in the form of subsidies to scientific societies, travel grants, and so on. The deal negotiated by Chris Wylie, then Publications Officer of the society, involved the CoB making a major payment in exchange for the right to publish the symposium. At the time *JEEM* was being published in hard bound issues, so the symposia could be hard bound in similar format. The first of these was produced by myself, from the Spring 1985 meeting in Glasgow on "Early Amphibian Development". (The Spring 1984 meeting in Leicester on "Programmes for Development" had also been published in *JEEM* but on an *ad hoc* basis). The symbiotic arrangement between the CoB and the BSDB put the society onto a sound financial footing for the first time and enabled it to plan for the future with confidence. *JEEM* was also used to publish the abstracts from the BSDB's first really big international meeting which was the 1984 European Developmental Biology Congress, held in Southampton and running for 6 days. This was managed by Peter Thorogood, later secretary of the society, and had 760 registrants with a turnover of £77,220.

A Newsletter started to be issued to members from 1979. It started as a few duplicated sheets and gradually evolved into a printed booklet. However, the committee has resisted the temptation to let it grow into a new journal and it has always served to publicise future meetings and include a few book reviews.

The molecular era

From about 1986 the equally important Spring and Autumn meetings started to resolve into a big international Spring meeting, normally held concurrently with the British Society for Cell Biology, and a smaller, mainly domestic Autumn meeting, usually held alone, or in *ad hoc* partnership with other societies. The Spring symposia since 1986 have been as follows:

- 1986 Determinative events in early development
- 1987 The mammalian Y chromosome
- 1988 Mechanisms of segmentation
- 1989 The molecular basis of positional signalling
- 1990 Chromosome imprinting and transgenic animals
- 1991 Cellular and developmental neurobiology
- 1992 Gastrulation
- 1993 Signals, polarity and adhesion in development
- 1994 The evolution of developmental mechanisms
- 1995 Cell migration-the basis of morphogenesis
- 1996 Regeneration, growth and pattern
- 1997 Genetic control of development
- 1998 Developmental pathways
- 1999 Cell polarity and development
- 2000 Pattern formation and the control of cell number

The high profile that the Spring meetings have acquired has posed its own problems. The meetings are so expensive that it is felt vital to guarantee a good attendance (i.e., more than 500). This means lots of international "stars" and a reluctance to take risks on young unknowns. The contributed paper sessions have disappeared because the main symposia expanded to three days and forced them into parallel session status. Once you have a parallel session of a few British unknowns pitted against a glittering array of international superstars, then of course the Contributed Papers get no audience. The current policy to deal with this is to allow a few carefully selected junior speakers into the main programmes, and to sponsor some regional meetings totally separate from the main Spring and Autumn events. The other problem is apparent from the increasingly vague themes of the meetings. The big stars all work on things that are currently fashionable, and that makes it difficult

to break away from a similar programme (and often the same speakers!) year after year. This carries the danger that important areas in which there has not been much recent progress will be ignored, and if they are ignored then there will continue to be little progress. Although the Autumn meetings are supposed to be smaller scale affairs it seems difficult to keep them down and several recent ones have had a lot of international speakers despite the strict budgetary control exerted by the committee.

The BSDB has always been an academic rather than a campaigning society. It is sometimes asked to provide input to deliberations by Research Councils or Government bodies, and in the mid-eighties it made representations about the Warnock Report on Human Fertilisation and Embryology and the Animals (Scientific Procedures) Bill. It does also occasionally protest about things, and in the early eighties did so several times over general Government cuts in the areas of higher education and research. But when asked by the American society in 1997 to campaign for a moratorium on human cloning we felt that the society did not have enough influence to achieve this and a call would simply generate unnecessary adverse publicity in the media.

In 1995 the BSDB recruited its 1000th member and the figure at the turn of the millenium was 1246. When I was secretary, I noticed that almost all the new members came from a very small group of special centres, most of which are in London. They are the National Institute for Medical Research, King's College, the Institute of Child Health, Guy's Hospital Medical School and University College. Together with the Wellcome/CRC Institute in Cambridge, these centres carry out a high proportion of the developmental biology research in Britain. Activity in most UK universities has been limited although some new university groups have been set up recently, including a big centre in Sheffield headed by Phil Ingham, and my own smaller group in Bath. Hopefully, such initiatives will enable the special centres to continue to be able to recruit PhD students with some knowledge of the subject.

Although there is always some problem to worry about, such as how to get younger speakers onto the platform or how to control spendthrift meeting organisers, in general I am pleased to report that the BSDB, in 1999, is very healthy, and in this health it reflects the fundamental strength of the UK in developmental biology research.

Acknowledgement

As I was myself still (just) in meiotic prophase during the first meeting of the London Embryologists' Club, and did not see my first cleaving sea urchin embryo until 1965, or do my first graft until 1974, I am indebted to the successive secretaries of the BSDB for keeping the archives, and to Frank Billett, John Gurdon and Chris Graham for useful comments on drafts of this paper.