
Book Reviews

The Power of Bacterial Genetics: A Literature-Based Course. By JONATHAN BECKWITH and THOMAS J. SILHAVY. Cold Spring Harbor Press 1992. 828 pages. Price: Cloth \$85 (ISBN 0 87969 411 4). Paper \$59 (ISBN 0 87969 379 7).

This book evolved from courses given by the authors at Harvard and Princeton, designed to teach students of microbial genetics and molecular biology to appreciate the history of prokaryote genetics, to read the scientific literature critically, to think logically about experimental designs and to realize the contemporary importance of prokaryote research. It contains 13 sessions, each devoted to a single theme and consisting of reprints of 5–8 classical papers, a concise authors' commentary on the meaning and importance of these papers and a series of boldly displayed questions to provoke classroom discussions or further study.

These sessions deal in succession with (1) Conditional Lethal Mutations, (2) Mutation I: The Nature of Mutations, (3) Mutation II: Nonsense Mutations, (4) Mutation III: Origin of Mutations and their Correction, (5) Suppressors, (6) Regulation I (the operon and negative control), (7) Regulation II (in Bacteriophage Lambda, and in the *gal*, *araBAD*, *trp* and *his* operons), (8) Site-Specific Recombination, (9) Transposition, (10) Atomic Genetics, (11) Protein Targeting, (12) Regulation at the Membrane, and finally (12) Genetics and Social Issues.

The course is intended to be neither a lecture nor a student seminar series. The students should read and think about all the papers, and each should come to the class prepared to give a five minute summary of the important points in any paper in the session. The course instructor can use these summaries to initiate discussion, or can call on students at random to answer specific questions, describe particular experiments, comment critically, etc. The course is designed for advanced undergraduate or graduate students familiar with the principles of bacterial genetics. They might meet for 3 hours once a week and should each produce a five-to-eight page research project of his/her own, for discussion towards the end of the course.

The course contains 85 reprinted papers covering about 800 large-format pages, often in rather small print, and also lists a number of important papers which ought to be read. The book is, therefore, a most valuable compendium of the development of a branch

of molecular genetics of great importance and interest, which still has current relevance: it will also make a very hard period of study if the course structure is adhered to and will also be hard going for the tutor. The course is, perhaps inevitably, angled a little towards work of the authors' colleagues and friends, with a tendency to quote American work. There are also important topics in early bacterial genetics that carry lessons, of which I found no mention, such as elucidation of the mechanisms of gene transfer by mating, by temperate phage and by DNA uptake, and the history of R factors, whose medical importance can hardly be overestimated.

But these are minor quibbles, and the book provides an extremely valuable, indeed unique, insight into one of the most productive and exciting periods in the history of genetics. I found it absorbing and shall continue to get pleasure and benefit from its further study. Close study of the many classical papers reprinted and an attempt to answer the questions posed by the authors will certainly stretch the mind of any student who has sufficient background knowledge to understand the complex technology applied in many of these papers.

The only major question is whether present-day students of molecular biology, who will be mostly very eager to get busy on eukaryotic problems, can be persuaded to give proper attention to such a difficult and largely historical subject.

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Audio Cassettes of the 17th International Congress of Genetics. ICC, Birmingham, UK., 15–21 August 1993. Available from QED Recording Services Ltd, Lancaster Road, New Barnet, Herts, EN4 8AS. Tel: 081 441 7722 Fax: 081 441 0777. Price including VAT and p. & p. £7.25 per tape in the Economic Community and £7.97 per tape outside.

The 17th International Congress of Genetics, held at the Birmingham International Congress Centre in August, was poorly attended in spite of presenting an excellent programme of lectures and workshops covering a very wide field, and the Proceedings have only been published as a volume of Abstracts, some of which are missing, very short and/or contain no references.

QED Recording Services, which has recorded many conferences, made a complete recording of the opening address, plenary lectures and symposia of the Genetics Congress on 104 audio tapes, and I brought home a sample for review. This set of tapes contains the only available record of the text of the plenary and symposium lectures, and should be of interest to many geneticists who did not get to the Congress and to some of those who did. A cheap little portable player and simple headphones, such as adorn the heads of many walking teenagers, gave me excellent sound, so I can recommend the recording quality. Each tape is double-sided with 45 minutes per side.

The tapes I have listened to are (1) Max Perutz on 'Should genes be screened?', (2) French Anderson on 'Gene therapy', (9 & 10) N. Barton, A. Orr, W. Rice & D. Futuyama on 'Speciation mechanisms', (20) Barry Hall on 'Selection-induced mutations', (29) Richard Lewontin on 'Population genetics, old and new', (38) Elliot Meyerowitz on 'Understanding flower development', (93) Alec Jeffreys on 'Genetic fingerprinting' – the Fisher Memorial Lecture in the Public Awareness series, and (95) M. Swaminathan on 'Feeding the world in the 21st Century' in the Public Awareness series (the numbers in brackets are the QED tape numbers). These are a random sample picked up in a hurry from the QED desk, but all were well worth hearing.

Ideally, major scientific libraries should have a complete set of these tapes, but there is no likelihood of that, since most libraries cannot afford many of the books and even journals one needs to consult. A number of the tapes would be of value for school biology students and many would interest University students. QED can supply a list of speakers, titles and tape numbers, but a better idea of the lecture contents can be obtained from the book of Congress Abstracts, which would have to be borrowed from someone who attended the congress.

The 1988 Genetics Congress in Toronto gave birth to a very handsome Proceedings volume, containing 490 large format pages with the complete texts of the Plenary and Symposium lectures, including figures, some in colour, and references, and even summaries of the talks given at each workshop. This volume, published as a single number of the journal GENOMICS, was available very cheaply, doubtless as a result of considerable sponsorship, such as we cannot obtain in the UK. It is a misfortune that we have nothing of this kind from the Birmingham congress.

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Mechanisms of Molecular Evolution. Edited by N. TAKAHATA and A. G. CLARK. Japan Scientific Societies Press, Tokyo and Sinauer Associates, Inc., Sunderland, Mass. 1993. 250 pages. Price not available. ISBN 4 7622 6718 X/0 87893 825 7.

Inference on evolution from molecular genetic data is a major field in modern biology, and deductions can be drawn at the level of individual molecules and at the level of populations. This volume deals with the latter, and the editors, Drs Takahata and Clark, have thereby given the book a subtitle to define the topic, 'Introduction to molecular paleopopulation biology'. It comprises 13 papers from a symposium held in Japan in late 1991.

The volume provides a nice review of recent work in the area. Some papers consider general theoretical principles and methods of data analysis (Takahata, Hudson, Tajima, Golding). Reflecting the maturity of the subject, others deal with more specialized topics, several on selection and interactive systems which have previously been mainly the domain of population genetics theory rather than of molecular approaches: self-incompatibility alleles (Clark), co-evolution of *Plasmodium falciparum* (the malarial parasite) and the immune responsiveness of the host (Hughes), the HLA system of man (Satta), and the t-haplotype of the mouse (Morita). A group of papers deal with the evolution and population genetics of *Drosophila* (Aquadro, Takano, Wu, Matsuura) and *E. coli* (Whittam).

It is not possible to give any comprehensive review of the whole, so I shall mention parts I particularly noted. For example, in much of theoretical population genetics, constancy of population size is assumed, and it was nice to see a review of the consequences of big changes. Not surprisingly, these are substantial since it takes the dynamics of a population a long time to reach steady state. The coalescent is now becoming widely used, both because it provides a route to analysis of some difficult problems and a nice insight into the evolutionary process, and examples of its use are given. Direct experimentation is now leading to an understanding of how Haldane's rule on the unfitness of the heterogametic sex in species crosses actually works in specific cases.

There is plenty in the volume worthy of detailed reading, and it is well produced.

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