

## Book reviews

**Weckherlin, A. von: Abbildungen der Rindvieh- und anderer Haustier-Rassen. Stuttgart, 1827–1834.** Edition "libri rari" Th. Schäfer: Hannover 1984. 104 pp., 36 figs., 36 tabs. Hard bound DM 148.–

The reviewing of a volume such as this does not fit into my usual tasks. It belongs to the category of "libri rari" and consists of the reprint of a collection of lithographs of representations of unusual breeds of cattle, sheep, etc. originally made in 1825 under the patronage of King Wilhelm I of Württemberg. The criterion of choice was primarily one of practical use. His majesty took great interest in agrarian development and the breeds had been purchased first and foremost so that they could be observed in detail on the royal farms, which had been themselves bought for the purpose. It was a time of great development in European agriculture when, after the Napoleonic wars culminating in Waterloo, the standard of living was at a very low level. "The years 1816/7 were times of hunger and destitution which, in the opinion of contemporaries, had brought half the population to the level of beggary."

A similar volume devoted entirely to horses had been produced in 1824 – the present one is mostly concerned with cattle and sheep and a single breed of goats. The collection was not made out of sheer curiosity. A table of milk yields with composition and body measurements gives information on the cattle and it is notable that these include several improved breeds specially imported from Britain.

As well as the King himself, five other individuals played a notable part in the initial production of the book. First is the King's steward Weckherlin, responsible for the collection of the animals and the overall management of the royal farms. He eventually became Director of the Agricultural Institute of Hohenheim (now the University of Hohenheim) and was the author of the standard text book of animal production, which went into four editions. The lithographs of the corresponding book on horses had been carried out by the Swedish professor Ekeman-Alleson who was responsible for the first seven illustrations in the present folio. Ekeman-Alleson died in 1828 and the remainder were done by G. Kustner. The detailed description and discussion were done by Weckherlin himself.

The whole is presented in a present-day framework by two commentators – Prof. Comberg, retired professor of animal breeding in the veterinary school in Hanover and Dr. Klaus Hermann, Lecturer in Agronomic History at the University of Hohenheim. The latter points out how often the details of the drawing are actual – in the sense that the buildings portrayed really existed.

A. Robertson, Edinburgh

**Gluzman, Y. (ed.): Eukaryotic Transcription (The role of cis- and trans-acting Elements in Initiation).** New York: Cold Spring Harbor Laboratory 1985. X + 200 pp., several figs. and tabs.

This book contains thirty very short papers presented at the second Banbury Conference at the Cold Spring Harbor Laboratories in March 1985. It presents the initial discovery and characterization of enhancer elements, and there are

cogent discussions of the cell- and tissue-specificity of enhancer elements. Each paper contains a brief introduction, succinct pertinent results, followed by a clear discussion and pertinent references. The introduction to the book by Walter Schaffner provides essential information to familiarize the reader with the role(s) of *cis*- and *trans*-elements in eukaryotic transcription.

Of the thirty papers, eight report on viral enhancers, covering work on SV40, Adenovirus, and Polyoma viral enhancers. Two papers report work on the mouse immunoglobulin heavy chain gene and the tissue-specificity of the enhancer involved. The remainder of the papers cover: *cis*-acting elements involved in cell-specific expression of pancreas genes; the effect of growth factors on proto-oncogene expression; gene expression in yeast; elements involved in the expression of the *Drosophila* yolk protein genes, ADH gene, and the 68C Glue gene cluster; elements involved in regulation of the metallothionein gene, human histone H4 gene, and the human interferon gene; hormonal regulation of the ovalbumin gene; and cell-specific factors required for RNA polymerase II and III.

All scientists interested in the role of *cis*- and *trans*-acting elements, and in transcriptional regulation would find this little book very valuable. The book contains a wealth of current information, valuable concepts, and useful bibliographies. Although the chapters are abbreviated, each contains significant information on a current and complex subject. Both the Editor and the Authors have done an excellent job, and add further to the significance of the Cold Spring Harbor volumes.

J. G. Scandalios, Raleigh

**Satir, B. H. (ser. ed.): Modern Cell Biology, Vol. 4.** New York: Alan R. Liss 1985. IX + 240 pp., several figs. and tabs. Hard bound £ 28.00.

This book provides information about recent developments in several topics of cell biology like cell motility, energization of cells, differentiation of kidney tubuli and intracellular membrane junctions.

The first chapter deals with the movement of cilia, the way the motility of the cilia is controlled, and energization of the cilia movements. Also, control of cilia behaviour by  $Ca^{2+}$  and c-AMP is dealt with. It is hypothesized that both compounds determine the phosphorylation of proteins involved in the regulation of ciliary motility.

The second chapter surveys the mechanism of proton motive formation. This chapter focusses on the thermodynamics of pmf formation, and the stoichiometry of proton flux and ATP hydrolysis. Also, localized chemiosmosis is dealt with.

The third chapter examines the external factors involved in the differentiation of the kidney with emphasis on the formation of kidney tubuli. The roles of transferrin and the extracellular matrix in tubulogenesis are dealt with.

Chapter four gives a short summary of chemotaxis in microorganisms. The main topic is the way microorganisms are able to adapt to changes in ecological conditions by means

of catabolite repression of flagellar synthesis. This phenomenon is called chemokinesis.

The last chapter provides a survey of different forms of intercellular membrane junctions like gap junctions, tight junctions and desmosomes. It is illustrated by a great number of E. M. photos. Also, the development of the junctions is dealt with. The effect of both c-AMP and hormones and differences between normal cells and malignant cells are surveyed.

G. Borst Pauwels, Nijmegen

**Pharis, R.P.; Reid, D.M. (eds.): Hormonal Regulation of Development. III. Role of environmental factors. Encyclopedia of Plant Physiology, New Ser., Vol. 11.** Berlin, New York, Heidelberg, Tokyo: Springer 1985. XXII+887 pp., 121 figs. Hard bound DM 398,-.

If one has to believe the authors of this volume, of which part I treats factors internal to plant, the only effect of genotypes in the hormonal regulation of plants is the length of the juvenile period. Even the preceding part I and II of the hormonal regulation volumes on molecular and cellular functions of plant hormones touch only lightly on the genetic aspect. In the volume in question, written, edited and published in the well-known, excellent way, the interrelations of plant hormones with factors in the environment of the plant, and its organ and tissues are discussed. The above-mentioned lack is not essential, although I would consider gene activity also part of the internal environment.

Not only are the traditionally included factors such as gravity, light, temperature reviewed but also wind, mechanical wounding, water, magnetic and electrical stimuli appear to have at least some influence on plant growth and differentiation and may act via the hormones. Even more esoteric environmental factors such as symbionts, pathogens, and pollen have been included. An excellent overview on eco-physiological perspectives and evolutionary implications of environmentally mediated hormone-regulated process is given by F. Salisbury and N. G. Marinos, which should be read by all ecologists for a better understanding of their hobbies. Again one must be grateful to the numerous authors who spent quite a lot of time and energy to critically review in a constructive way a field of plant physiology which is progressing so fast.

H.F. Linskens, Nijmegen

**Lötschert, W.: Palmen, Kultur, Nutzung.** Stuttgart: Ulmer 1985. 152 pp., 98 figs.; 30 tabs. DM 78,-.

It is surprising that in this pleasing book on palms, a plant called "principes", that is prince of the plant kingdom, by Charles Linné, not one word is said about the genetics and breeding of this most important plant of tropics. For more than 3,000 years man has used palms as producers of oil, dates, coconuts: even the oldest presentation of artificial pollination shows palms.

The late professor of Botany at the Frankfurt University, W. Lötschert, gives a detailed description of the geographical distribution, morphology and ecology of palms, with emphasis on the palm-man relationship. Most interesting are the chapters on the history of palm in relation to man, their use as a crop as well as ornamentals in parks and gardens, and greenhouses. For the amateurs and gardeners there are detailed instruction on propagation, germination, pests and diseases. The greater part of the book covers an annotated list of the most important species in alphabetical order. The list of references is short but to the point. The monograph is rounded off by an

index of latin and german plant names. The modern long-distance tourism brings many peoples from temperate climates zones in contact with palm trees. The book is therefore a useful guide for all those who like palms not only as a supplier of oil, but also as one of the most decorative and beautiful plants of all.

H.F. Linskens, Nijmegen

**Sussex, I.; Ellingboe, A.; Crouch, M.; Malmberg, R. (eds.): Plant Cell/Cell Interactions. Current Communications in Molecular Biology.** New York: Cold Spring Harbor Laboratory 1986. 151 pp., several figs. and tabs. \$ 27,-.

In October 1985 a meeting on Plant Cell/Cell Interactions was held at the Banbury Conference Center which covered several diverse fields that have in common the bringing together of plant cells with the consequence of interactions of two distinct cellular genomes and developmental potentials. There are two main fields of inquiry: self-incompatibility and host-pathogen-interactions. The genetics of plant self-incompatibility is in a sense a logical inverted phenomenon to mammalian immuno genetics. The genetic bases are well known. The short papers of the book show that there is promising progress in the molecular characterization of S-alleles in gametophytic and sporophytic systems.

In addition to these reports, which foreshadow the better understanding of the mechanism and its possible manipulation, reports are given on sexual agglutination in algal gametes, on mating types of the basidiomycete *Schizophyllum*, on graft chimeras and host-pathogen interactions, especially virulence, nodulation, transformations, resistance and the possible role of pectic enzymes in plant-pathogen specificity. The reports are so short that they only wet one's appetite. Anyway: its speedy publication is to be commended.

H.F. Linskens, Nijmegen

**Böhme, H.; Mettin, D.; Müller-Stoll, W. R.; Müntz, K.; Rieger, R.; Riethm, A.; Scholz, F.; Stubbe, H. (eds.): Die Kulturpflanze. Mitteilungen aus dem Zentralinstitut für Genetik und Kulturpflanzenforschung; Akademie der Wissenschaften der DDR, Gatersleben, Band 33.** Berlin: Akademie-Verlag 1985. 370 pp., 65 figs., 34 tabs.

This newest volume is a triple hybrid between an annual review, a scientific journal on plant breeding and an annual report of an large institute of the German Democratic Republic. Unfortunately one misses once again information on the internal structure and personal of this important institution of research on cultivated plants. Some retrospective details are given on research goals and selected results of the period between 1969 and 1983, as well as on a cooperation project on mutation breeding with the Bulgaria Institute of Genetics at Sofia. The volume under review starts with an obituary (W. Kulpa) and continues with 5 reviews, among which are included the interaction between C- and N-metabolism, the application of protoplast technology in breeding research of potato, and the structure of the thylakoid membrane of chloroplast as a site of photosynthetic primary reactions. Fourteen technical papers follow, the majority by K. Hammer or with him as co-author. Some of them are of special interest for plant breeding: e.g. disease resistance of *Aegilops* against mildew, glume blotch and stem leaf and stripe rust. Most interesting are the reports on collection missions in Georgia, Poland, Southern Italy and to the Ghat Oases (Sahara). Literature reviews on the archaeological remains and taxonomy and evolution of cultivated plants are continued. Finally, the

reader gets some information on the institutes activities which demonstrates the strong emphasis on cell genetics, molecular biology of primary production, taxonomy of crop plants and applied genetics. The volume is rounded off by a list of colloquia, expositions, meetings and lectures, a subject index.

H. F. Linskens, Nijmegen

**Christiansen, F.B.; Feldman, M.W.: Population Genetics.** Edinburgh, Boston, Victoria, Palo Alto, Oxford, London: Blackwell 1986. IX + 196 pp., several figs. and tabs. Soft bound £ 14.80.

The focus of this book is succinctly given by the authors in their Preface: "This book intends to provide a basic introduction to population genetics and to convey the spirit of interplay between observation and theory-aided interpretation that has characterized its history. It can be used either as a text for a short course in population genetics or as a supplementary text for a course in general genetics or population biology."

In this era where there is a plethora of general genetics textbooks which tend to cover too much material for an introductory course in genetics, but which provide insufficient depth for succeeding courses in particular areas of genetics, it is refreshing to have a text such as this. Although it is an introduction to the subject, it is rigorous in presentation, and it would be appropriate for a one-semester course. Students will get the feeling that there is much more to population genetics that would be worth pursuing.

The particular value of the book is the attention given to describing both phenotypic and genetic variation, (Chapter 1 – about one-third of the book), and the analysis of quantitative variation (Chapter 4), as well as the more 'classical' population genetics theory (Chapters 2 and 3).

However, and again from the Preface, "Our presentation is oriented towards human population genetics and it is from humans that most of our examples are drawn". The emphasis in fact goes further than this, with the final Chapter 5 ("Mendelian Genetic Diseases in Populations") discussing not only the theory of the population genetics of Mendelian diseases but also counselling on and eugenic considerations of Mendelian diseases. Thus the book would be an excellent text for a population genetics course for pre-medical or medical students.

But this is not to discount its value to general biology, agriculture or veterinary students. General biology students would be attracted by the human emphasis, while students of domestic or natural populations should be more aware of the specific theories and methodologies that have been developed in the context of human population genetics. The discussions of Mendelian genetic diseases and of the genetic contribution to other diseases (liability) are very relevant to animal geneticists who are becoming increasingly concerned about losses due to disease in animal production systems.

The text is well supported by tables and figures (although I found it annoying that some are two to three pages removed from the reference to them in the text), and appropriate examples are drawn from many species other than *Homo sapiens*. I assume that every high school biology student knows *Drosophila*, so I find it strange that for this organism, the authors consistently refer to fruitflies; there is even an index entry "*Drosophila*. See Fruitflies"!

My one caveat concerns the exercises included – not their content, but their incorporation in the text. Exercises are included in each section, and the student will benefit from working through them, but they are almost an integral part of the text, and it is sometimes difficult to find where an exercise

ends and text matter resumes. A simple line at the beginning and end of each set of exercises would have been useful. Further, the exercises are clearly designed for self-tuition by the student, so that answers to all (and not just some) should have been included.

This is a book to be recommended and to be widely used.

J. S. F. Barker, Armidale

**Strohman, R.C.; Wolf, S. (eds.): Gene Expression in Muscle, Vol. 182.** New York, London: Plenum Press 1985. X + 434 pp., several figs. and tabs. Hard bound \$ 62.50.

This volume contains the transcript of a meeting held in October 1983 at which research on gene expression in muscle was presented in the context of an understanding of the pathogenic mechanism of Duchenne Muscular Dystrophy. It includes sections on Phenotypic expression and molecular markers for muscle disease, Regulatory influences on muscle growth, Regulatory expression of protein isoforms and Recombinant DNA approaches in the investigations of muscle gene expression.

Many of the chapters (31 in all) are so brief that the reader only obtains an overview of the topic, but this problem is at least partly overcome both by the inclusion of participant discussions and a single reference list. Indeed, as is often the case with conference volumes, it is the questions and answers that make the most compelling reading. A criticism throughout the book is the small number of figures and tables – more visual data certainly improves the reader's understanding.

The highlights of the volume are the chapters on the growth of cultured myoblasts including the concept of a dystroblast, muscle gene expression in heterokaryons and those on recombinant DNA approaches. These make interesting reading especially to scientists whose main interest is not Muscular Dystrophy. Much of the book is directed towards myosin isozymes, their changes in proportion during development in vivo and in tissue culture. This work appears to add little to our understanding of Duchenne dystrophy, although it is certainly relevant to gene expression.

The biggest disappointment is the title. Purchasers expecting to obtain a comprehensive review of "Gene expression in muscle" will be very disappointed by the focus on dystrophy while those looking for an update on the more basic aspects of muscular dystrophy will not be attracted to this volume by the title.

F. J. Ballard, Adelaide

**Pattee, H.E. (ed.): Evaluation of Quality of Fruits and Vegetables.** Westport (Conn.): AVI Publishing Co, Inc. 1985. 410 pp., 32 figs., 100 tabs. \$ 89.50.

It is strange that these food technologists did not mention anywhere in this most interesting book on the sensory evaluation of vegetables and fruit neither the genetic aspects nor the human factors in the decision-making process. There are two exceptions: the genetic influence on sweetness, and the harsh flavor and bitterness of carrot, not an extensively investigated crop, and flavor variation in tomato. Nevertheless, it is a most valuable book which is based on the presentations of a symposium entitled "Sensory evaluation of fruits and vegetables: effect of environment, cultural practice and variety, held 1982 in Kansas City". The title of the meeting circumscribes exactly the contents of the book. The 14 chapters, each of which is written by an expert par excellence, are a bit selective, so that they together don't cover the whole field: peach, pear and apple quality and factors that condition harvest product; citrus, grapes, cranberries, strawberries are

partly considered for pre- and post-harvest quality; others for the effects of production and processing on sensory quality. Sweet potato, peanut, carrot, green beans, sweet corn and tomato get a more chemical touch.

The quality of fruits and vegetables is of eminent importance for their market value. Plant breeders always have that in sight. A cooperation with food technologists could bring sensory evaluation to a higher level of objectivity.

H. F. Linskens, Nijmegen

**Kingsland, S. E.: Modeling Nature, Episodes in the History of Population Ecology.** Chicago, London: University of Chicago Press 1985. IX + 267 pp. Hard bound \$ 31,50

Sharon Kingsland's book has little to say about genetics, yet its focus is the historical development of those areas whose tenuous link with population genetics was eventually made in the 1960s under the umbrella term 'population biology'. In a semi-biographical text, we are led through this century using the prophetic eyes of Lotka, Pearl, Volterra, Nicholson, Gause, Lack, Hutchinson, and MacArthur. Energetics and system approaches do not get a look in. That, perhaps, is all for the good. After all, Kingsland's brand of population ecology has its own genuine traditions, and it does define the area of ecology of most interest to population geneticists.

As we know, population ecology never had its Mendel's Laws and, therefore, the models were never so natural as they were for its sister discipline. That being said, Kingsland covers a rich intellectual tradition, and she does it with authority. Later sections of the book obviously owe much to conversations with G. Evelyn Hutchinson, and the inspiration of Robert MacArthur. There is no doubt that the author understands her subjects; both the people and their research.

This book provided me with a deeper historical perspective on the development of population ecology as an academic discipline. If you want to know why some key figure in the field produced a classic paper or book at a particular time, the chances are that Kingsland will provide the answer. She always attempts to reveal both the questions that people were really attempting to answer and the influences that helped them progress. Her book is thoroughly researched and, since she never wavers from her quest to understand the develop-

ment of a tradition, her book never fails to fascinate. I found it compulsive and instructive reading.

P. H. Harvey, Oxford

**Easterlin, R. A.; Crimmins, E. M.: The Fertility Revolution. A Supply-Demand Analysis.** Chicago, London: University of Chicago Press 1985. XIX + 209 pp., several figs. and tabs. Hard bound \$ 28.75.

In recent history, socioeconomic modernization has everywhere been accompanied by a "fertility revolution": the spread of deliberate family size limitation. The explanation of this phenomenon is the subject of the present book. The theory focuses on the causes of adoption of deliberate fertility control. In demographic analyses motivation for family planning is usually measured by the demand for children. In contrast, the present theory, and here Prof. Easterlin's background in economy surfaces, measures motivation by the excess of supply of children over demand. Further, the costs of family size regulation, both measured by real expenses and by perceived costs (e.g. religious and moral objections), are also considered. This supply-demand theory of fertility determination is tested and applied, both on the micro and the macro level, to data from various developing areas, that differ widely in socioeconomic, cultural, and religious aspects. Because improved nourishment and health care enlarge the potential supply of children, modernization has a positive effect on fertility. At the same time, demand often decreases. Thus, motivation for applying birth-control measures increases. Initially, the fertility-enhancing effects of modernization may offset the effects of fertility control, sometimes causing concern about the effectiveness of family planning programs, but in the long run ever higher rates of acceptance of fertility-regulating measures will emerge. The analyses of the data chosen as examples highlight and confirm important aspects of the theory. These analyses also lead to important conclusions and in their final chapter the authors present some implications for future research and for family-planning policy.

The book is well-written and the generally nontechnical approach makes it also possible for laymen in the field (such as the present reviewer) to read it without great difficulty.

W. E. Crusio, Heidelberg