

BOOK REVIEW

B-CHROMOSOMES. R. N. Jones and H. Rees. Academic Press Inc. (London). Price: £24.00.

B-chromosomes are unnecessary for the growth and reproduction of the individual, and for this reason they have been rather neglected in comparison with other chromosomal variants such as inversions, translocations and Robertsonian changes. In seven chapters, this book seeks to redress this imbalance by presenting the facts about the occurrence, structure, inheritance, effects, population dynamics, ancestry and evolution of B-chromosomes and by considering their role and significance in the genetic system.

This is no mean task for, apart from a couple of short reviews the information on these chromosomes is in research papers scattered through the biological literature and some are really quite obscure.

The references, the accompanying Atlas of B-chromosomes which lists all the species reported with these chromosomes, the subject index and species index take up 120 pages—nearly half the book. This in itself is a most valuable compilation for both elementary and advanced students of the field. It also allows the authors to draw significant general conclusions based on a broad, well researched data base.

On the subject of their occurrence, even after many years working in the field I was surprised at how many angiosperm species have B-chromosomes—some 3 per cent, and contrary to earlier statements B's are widely distributed in polyploids as well as diploids. Whilst animals are less well researched here again B's are shown to be widely distributed. The large number of species with B's in groups like the grasses and grasshoppers would seem to be due to them being favoured by cytologists!

An earlier generalisation which is confirmed by this fuller consideration is that nearly all B-chromosomes show some form of accumulation mechanism. A whole chapter is properly devoted to the various ways that B's promote their survival by non-disjunction and preferential segregation in mitosis and meiosis.

Another chapter describes and discusses the variety of phenotypic effects of B-chromosomes—on cell contents, growth of tissues, chiasma formation and control of pairing—and corrects the frequent misconception that because B's are not necessary for individual development they are without effect.

The counterpoint between the forces tending to increase B-frequency and those tending to decrease it is pleasingly presented in the chapter on Populations and Adaptation. Observations and experiments from field and laboratory show that while B's are usually deleterious there are conditions where they increase survival of the individual. A brief consideration of one piece of work in the current vogue of computer simulation points out that accumulation mechanisms can generate a stable polymorphism for B's despite disadvantageous phenotypic effects.

The final, discussive chapter considers the Ancestry and Evolution of B-chromosomes. There is little hard evidence on this fascinating aspect and the authors rightly stress that it is the modification of this pairing and genetic expression of a trisomic element rather than its initial production that is at the heart of the problem.

From someone who has known both authors and their work for some years it is pleasing to see the simple logical structure of this book and the clarity of its prose. One can detect the characteristic way in which a familiar observation is viewed from a different and revealing angle.

The book should interest and will certainly be of value to all who are concerned with chromosomes and with evolution, regardless of experience. Those whose interests lie with the more recent topics of selfish and redundant DNA will also benefit from this consideration of half a century's research and discussion on chromatin described as parasitic in 1945.

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BOOKS RECEIVED

EVOLUTIONARY PRINCIPLES. Peter Calow. Blackie. Pp. viii + 108. Price: £13.95 HB; £6.95 PB.

PAEDIATRIC RESEARCH: A GENETIC APPROACH. M. Adinolfi, P. Benson, F. Gianelli and M. Seller (Eds.). Spastics International Medical Publications with Heinemann Medical. Price: £15.00.