genes, except for the mouse, the rabbit (11 colour and fur genes out of 56), and *Peromyscus* (8 colour or pattern genes out of 23). No colour or coat characters are listed for the cow (60 genes), sheep (25 genes), dog (39 genes), rat (90 genes) or Chinese hamster (62 genes). Even the cat gets only two colour or fur genes (orange and albino) out of 57. This appears to be due to a very strong bias among the geneticists concerned in favour of biochemical/molecular markers, but details of all the colour, coat and morphological genes known would have been of interest.

Volume 3 gave details of the nucleic acid and protein sequence databases, but these are not mentioned in the current volume. So one cannot check how these sequences are progressing without turning to other sources. It is being suggested that the *E. coli* genome will have been completely sequenced within a few years and the human genome by the end of the century. But I am inclined to think that this will not make the further pursuit of bacterial and human genetics redundant.

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Germ Line – Soma Differentiation. Edited by W. Hennig. Berlin, Heidelberg, New York, Tokyo: Springer-Verlag. 1986. 196 pages. Price DM 98. ISBN 3 540 16635 1.

This volume comprises four reviews on the problems posed by the segregation of the germ line from the somatic cell lines, which in different groups of metazoa occurs at the cleavage stage of their embryos. However this problem may also be studied outside the metazoa; e.g. the recent work by D. L. Kirk's group on Volvox (*Genes Dev.* **1**, 573, 1987) shows that differential expression of a gene at the *regA* locus prevents somatic cells from redifferentiating as generative cells. These problems are among the oldest in developmental biology and were studied by A. Weismann (1885) for his germ-line theory and by T. Boveri (1887) in his classic observations on the cleavage stages of the nematode now known as *Parascaris equorum*. Here the segregation of the germ line from the somatic cells is accompanied by chromosome fragmentation and chromatin elimination in the somatic lines. It was subsequently found that in most animal species the differences between the germ line and the soma were not achieved by chromatin elimination, which then came to be regarded as a cytological curiosity peculiar to a limited number of species. However, these chromatin-elimination systems would seem to offer a fine opportunity to analyse the nature and the role of the eliminated DNA, but this opportunity seems to have been largely neglected. In well-studied embryos like *Caenorhabditis*, *Drosophila* and *Xenopus* for instance, germ line determination seems to depend upon the presence of germinal granules localized at the posterior or vegetal pole of the egg. Yet we still do not understand what component of the granules is essential to the determination process or how it operates.

The first review by H. Tobler: 'The differentiation of germ and somatic cell lines in nematodes' is a detailed work with a considerable bibliography, which not only does full justice to the topic indicated by its title, but has a wider scope. Indeed it manages to introduce most of the principles that have guided embryology in the past century while still maintaining a clear and uniform account.

The second review by S. A. Gerbi entitled: 'Unusual chromosome movements in sciarid flies' is concerned with the fantastically complicated chromosomal cytology of *Sciara coprophila* which was first studied by the late Charles Metz and latterly by Helen Crouse. Here germ-line differentiation is accompanied by the elimination of whole chromosomes, rather than by elimination of the distal arms of chromosomes as occurs in *Parascaris*. Moreover in sciarids some chromosome elimination occurs in the germ line as well as in the soma and the meiosis in males takes a most unusual form.

The third review by G. Steinbruck: 'Molecular reorganisation during nuclear differentiation in ciliates' concerns a subject which is now being tackled by a number of laboratories using modern molecular techniques. In ciliates each transcriptionally active macronucleus develops from a germ-line micronucleus. It appears that in those ciliates, like *Tetrahymena* and *Oxytricha* where the problem has been properly investigated, the micronuclei contain germ-line specific DNA which is eliminated in the course of macronuclear development. Micronuclear chromosomes are fragmented to form linear subchromosomal macronuclear DNA molecules, stabilised at their ends by added telomere sequences. Each macronuclear DNA molecule is usually derived from several non-contiguous micronuclear chromosomal segments that become joined together. It seems clear that the idea of constant DNA composition throughout the life cycle of the organism is not even remotely true of ciliates.

Chromatin eliminated from the germ line in nematodes and sciarids is heterochromatic so that appropriately the final short review in the volume is by W. Hennig and entitled: 'Heterochromatin and germ-line restricted DNA'. Here the properties of heterochromatin are restated together with the author's speculations upon the biological role of these DNA sequences with no protein coding function.

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