Caenorhabditis whose embryonic lineages are essentially invariant. Although genetic mapping, transposon tagging and germ-line transformation can all be exploited in *Caenorhabditis*, identification of strict maternal effect mutants, which are the ones that matter most in a mosaic egg, has proved unrewarding. Kemphues therefore devotes considerable attention to the data accumulating on the cytoplasmic localization of identifiable molecules, e.g. the asymmetric distribution of microfilaments in the one-cell embryo, and the posterior localization of germ line-specific P granules. Laser ablation of single cells suggests that most embryonic mechanisms are cell autonomous, but not all: the germ-line proliferation (*glp*) gene and *lin 12* both affect the differentiation of other cells and their DNA sequence organization is now being studied; but that is about as far as it has got.

Xenopus has essentially no genetics, so Sargent devotes his space to a thorough, critical review of what we know about the cytoplasmic determinants found in the egg, or more precisely to the postulated determinants. These, and the agents involved in induction of mesoderm, neural tube, etc. and all the events of classical amphibian embryology have not got much further than a descriptive phenomenology. It is true, of course, that some polypeptide growth factors are known to act as inducers, but proving their presence in the right place at the right times is another matter. Possibly more important has been the use of homoeobox sequences, first found as common parts of *Drosophila* homoeotic genes, to find equivalent nucleic acid binding proteins in vertebrate DNA libraries. The *Xenopus Xhox*-1A and *Xhox*-3 mRNAs have been so identified, are present at about the right time, and are found in antero-posterior gradients, the latter in the mesoderm. Injection of these mRNAs disrupts development.

This variety of surrogate genetics has been more successful for identifying homoeobox genes of the mouse: two dozen or so *Hox* genes have been fished out of DNA libraries. The *Drosophila* homoeobox genes are expressed in an anteroposterior sequence corresponding to their chromosomal order, and surprisingly their mouse analogues have the same organization and patterns of expression [Graham, A. *et al.* (1989), *Cell* **57**, 367–78]. This is the first clear evidence that genes of a very ancient lineage may have a developmental role in both arthropods and vertebrates. Not all genes are as accessible to molecular analysis and for these the experimental emphasis has moved to making transgenic mice, since it is relatively easy to microinject a cloned gene into a pronucleus of a fertilised egg. By using different promoters and reporter genes some of the many gaps in our knowledge of embryonic cell lineages may be filled; or alternatively cell specific ablation, using the cell lethal diphtheria toxin subunit A, may expose the importance of cell interactions. These molecular techniques can also be applied to embryonal carcinoma (EC) or embryonal stem (ES) cells grown in culture. These cells can be derived from mutants, including lethals, or made to carry known insertions, and then microinjected into the blastocoel where, usually, they will participate in normal development. As Jackson emphasizes in his very comprehensive review, all the methods of manipulating cells in culture can be applied to these embryonal cells, and in a proportion of cases the developing chimaeras will carry the transgene in the germline. The potential of these combined techniques is very great.

There are other organisms which might have been included in this text (slime moulds, sea urchins, leeches, etc.), but perhaps the four are enough for didactic purposes. As it is, the contrast between maternal determination in *Caenorhabditis* and its complete absence in the mouse – *pace* the curious phenomenon of imprinting – is enough to raise the question of how far the molecular mechanisms causing differentiation are similar in these cases. The implication of these surveys is that they are, but the problem is to prove it. Such different patterns of development and of experimental accessibility will give the reader pause for thought, something which the editors might have emphasised in their introduction. It is not just *Drosophila's* genetics, in the shape of balanced lethal techniques, etc. but also its particular pattern of development which has permitted the identification of developmental genes affecting embryo/larval morphogenesis, which are advantages not to be found among other organisms. Nevertheless, the empirical results described here, not theory, will continue to drive the subject forward; and that is quite a change in what has always been an over-philosophical subject.

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Cancer Cytogenetics. By SVERRE HEIM and FELIX MITELMAN. New York: Alan R. Liss, 1987; 2nd printing 1989. 309 pages. $35.00. ISBN 0 8451 4239 9.

Catalog of Chromosome Aberrations in Cancer. By FELIX MITELMAN. New York: Alan R. Liss. 3rd edition 1988. 1146 pages $165.00. ISBN 0 8451 4248 8.

Cancer Cytogenetics is a very readable, lucid and sensible book covering the entire field of chromosomes in neoplasia up to 1987. It is to be assumed from the need for a second printing in 1989 that many people already appreciate the vitality of this text, and it remains a classic despite some aspects, particularly in the area of molecular biology, being overtaken by the wealth of new research findings.

The book is divided into three parts, the first of which gives a brief history and overview of the subject together with descriptions of methodology and no-

menclature. This last is an area which causes problems for many non-cytogeneticists (and some cytogeneticists!) but the authors give simple definitions of the various terms and employ very clear diagrams depicting the rearrangements. These diagrams are used throughout the book together with photographs of individual chromosomes and this considerably simplifies the task of understanding the geometry of these rearrangements. Part 2 is the real meat of the book: 8 chapters each devoted to a single disease (e.g. CML, ALL) or group of diseases (e.g. malignant lymphomas, solid tumours). The book is very heavily biased towards the haematological malignancies, but this simply reflects the state of our knowledge; 87% of karyotypes published by 1987 were from haematological disorders. Each chapter contains a brief clinical description of the disease, a discussion of the cytogenetic abnormalities found together with molecular considerations where appropriate, and a separate section on clinico-cytogenetic correlations which is particularly useful for diagnostic laboratories. A vast body of basic material (see below) has been skilfully condensed and is very lucidly presented, with the authors' enthusiasm for the subject coming across clearly, but never being allowed to blur the distinction between fact, hypothesis and opinion. This is also true of the final part, 2 chapters devoted to oncogenes, anti-oncogenes and theories of carcinogenesis, although this is probably the part that suffers most from being overtaken by recent developments.

Throughout the book the authors have been fairly selective in their referencing but many of the references are to the most recent reviews so that it is often possible to delve more deeply with only the minimum of effort.

This book is a landmark in the field of cancer cytogenetics. It is only a fraction of the size and cost of Sandberg's epic tome of 1980 but it is far more accessible to students of genetics and to molecular biologists as well as to the cytogeneticists and clinicians working in the field, among whom it should promote significantly greater understanding.

In contrast to *Cancer Cytogenetics* Mitelman's *Catalog of Chromosome Aberrations in Cancer* is a highly specialized book of interest mainly to cytogeneticists and clinicians working very closely with cytogeneticists. For these people, however, this catalog is invaluable. It lists, with references, the karyotypes of all published cases of cancer [other than the t(9;22) of chronic myeloid leukaemia] that Professor Mitelman has been able to find (plus a few unpublished cases). Nearly all of the karyotypes are from direct or short-term culture; cell lines have only been included for a few tumours where other data are particularly scanty. This third edition details 9069 cases from 2156 references, showing the continued rapid expansion of this field since the 5345 cases of the 1985 edition and the 3844 of the 1983 edition. There are several changes in the handling of the material in this edition. The most notable are the addition of sections on double minute chromosomes and homogeneously staining regions, and a section on the molecular analysis of specific breakpoints. Bold type has been used to highlight the chromosome of interest in each karyotype so that it is much easier to scan the lists of complex karyotypes for the information wanted. A certain amount of reorganization of the groupings under morphological diagnosis also facilitates finding what you want, particularly among the solid tumours.

As well as the basic data, Professor Mitelman gives a brief overview of the catalog with interesting tables on the numbers of karyotypes for each disease and the numbers of cases involving each of the 24 chromosomes, clearly showing the non-random nature of chromosome involvement in neoplasia. The catalogue cannot be used to find the overall frequency of abnormalities in any disease as it does not include those cases with a normal karyotype but this is a very minor irritation.

This catalogue represents a vast amount of work and Professor Mitelman is to be congratulated on the frequency with which he continues to update the book. There are remarkably few errors for such a vast enterprise (other than those of the original reporters which are faithfully reproduced) and the changes in the third edition are all welcome. This book is not cheap, but I do not see how anyone in the field of cancer cytogenetics can afford to be without the latest edition of Professor Mitelman's *Catalog*.

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McGraw-Hill Dictionary of Scientific and Technical Terms. 4th Edition. Editor-in-Chief SYBIL P. PARKER. Maidenhead, Berkshire, UK. 1989. McGraw-Hill Book Co. Ltd. 2088 pages + Appendix. Hard cover. £65.00. ISBN 0 07 045270 9.

This handsome large-format book defines 100100 technical and scientific terms, a number which almost boggles the mind when set against the modest half-million words included in the new edition of the *Oxford English Dictionary*. The obvious implication seems to be that scientists and engineers spend much of their time inventing new terms to make their own disciplines more mysterious and awesome to the outsider – including those embedded in other disciplines. Can we possibly need all this vast array of terms? Or is it that the collectors of the terms to go in each of the 102 categories used in the dictionary vied with each other to amass the greatest number of items?

It is not easy to answer this question. The biologists can claim to have been very modest in listing organisms, since there must be 200000 or more named genera in the literature to choose from. The dictionary