which he has found to be generally applicable. This might have reduced the beginner's confusion over choosing the most appropriate procedures, since he has just read 55 pages describing alternative methods, loop-holes and pitfalls.

The second article deals with a medical application of recombinant DNA technology. P. F. R. Little summarizes the lesions of haemoglobin genes associated with different haemoglobin deficiencies and how they can be detected by Southern blotting of DNA from fetal cells obtained by amniocentesis. Two major principles are discussed: the first is direct demonstration of deletions within a globin gene itself; this approach is particularly valuable for certain thalassaemias. The second is based on the fact that deficient genes are often linked to polymorphism of nearby restriction endonuclease sites, which in turn is readily detectable. This approach can be applied to any dysfunctional gene where linkage exists, and does not depend on the nature of the lesion in the DNA. As, thanks to molecular cloning technology, our knowledge about genes increases rapidly, the antenatal diagnosis of lesions at the DNA level will certainly have an important future in preventive medicine.

Several systems to study the expression of cloned genes either *in vitro* or *in vivo* have recently become available. Two of them, the transcription of isolated genes in microinjected oocytes, and in cell-free extracts, are reviewed in an authoritative article by M. P. Wickens and R. A. Lasky. Most of the important published work carried out on the expression of eucaryotic genes in these systems is critically reviewed and put into perspective. *In vitro* transcription of genes, both wild type and after mutation *in vitro*, has been important in recognizing signals on DNA. This strategy succeeded in defining promoters for various genes transcribed by RNA polymerase III, and sequence elements in genes transcribed by RNA polymerase II which are required for correct initiation and modulation of transcription.

All three articles of the first issue of *Genetic Engineering* are well written and certainly worth reading. It seems to me that the articles which are published in this issue and are planned for publication in further issues could have been grouped more logically, for example by putting the construction of cDNA (this issue) and genomic DNA recombinants (planned for a future issue) into the same volume. The same holds true for Wickens and Lasky's article and the planned article on expression of cloned genes in transfected cells. However, if the promised publishing strategy is adhered to, the series should quickly build into a useful reference work on recombinant DNA technology. □

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Isolation and assay of insect hormones

H. F. Nijhout

Neurohormonal Techniques in Insects. Edited by Thomas A. Miller. Pp.282. ISBN 3-540-90451-4. (Springer-Verlag: 1981.) DM79, \$46.70.

IF IT is possible to pinpoint the birth of a biological discipline, then neuroendocrinology was born in 1917 when a Polish biologist, Stefan Kopeč, reported that the brain of gypsy moth caterpillars produced a hormone that stimulated pupation. The hormone he discovered we now call prothoracicotropic hormone (PTTH), because it stimulates the prothoracic glands to secrete the moulting hormone, ecdysone. In the decades that have passed since this landmark discovery, the recognition, isolation and identification of additional insect neurohormones has proceeded at a slow but steady pace and *Neurohormonal Techniques in Insects* provides an account of the current status of these endeavours.

The purpose of this volume is to provide a compendium of the methods that are currently used by various laboratories to collect, assay and purify the neuroendocrines of insects. The book is divided into 11 chapters dealing with as many neuroendocrine factors, to wit: proctolin; adipokinetic hormone; diuretic hormone; insulin- and glucagon-like hormones; bursicon; pupariation factors; cuticle plasticizing factors; eclosion hormone; diapause hormone and PTTH. Each chapter has a brief introduction establishing the biological properties of the hormone in question, followed by a review of various bioassay methods and finally a detailed description of the methods used in its isolation and characterization.

The first two chapters by Staratt and Steele and by Stone and Mordue on the isolation and identification of proctolin and adipokinetic hormone, respectively, are by far the best methods papers I have ever seen. The quality of the remaining contributions is, predictably, variable both in method of exposition as well as in the skill with which various problems are handled. Some of the defects become understandable, though, when one considers the enormous obstacles that must be overcome by those who discover a new hormone and venture to identify it. The numbers of insects that need to be worked up to extract a sufficient quantity of hormone are truly prodigious. For example, 125,000 cockroaches yielded 1.12 mg of proctolin, and fractionation of 96,000 silkworm heads yielded 3 mg of a heterogeneous residue possessing high PTTH activity. To make matters worse, the bioassays that must be used are cumbersome and consume vast quantities of time, manpower and hard-won hormone. The biggest problem, though, is that the specificity of a bioassay for a given

hormone is often questionable, and I found a critical consideration of what constitutes an optimal assay method and scoring procedure lacking in most chapters.

A budding biochemist should have no difficulty in following the rationale as well as the procedures employed by the various authors and it should be possible for any well equipped laboratory to employ the methods described to attempt their own hormone isolations. However, it is evident from the accounts in this volume that the development of reliable, and preferably biochemical, assays should be the first order of business for the future. □

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Creative catalysis

G.W. Parshall

Homogeneous Transition-metal Catalysis: A Gentle Art. By Christopher Masters. ISBN hbk 0-412-22110-1; ISBN pbk 0-412-22120-9. (Chapman & Hall: 1980.) Hbk £20, \$25; pbk £9.50.

THE gentle art described in this book is the synthesis of organic compounds through the skilful application of transition metal complexes as catalysts. Dr Masters' purpose in writing this book was to stimulate enthusiasm for this art. He succeeds admirably because he has produced not just a readable description of the subject as it exists today but also a perceptive analysis of developing research areas.

In the introductory chapter, Dr Masters describes the basic principles of bonding and reactivity in transition metal complexes in simple terms for the non-specialist. Phenomena such as oxidative addition, β -elimination and steric and electronic effects are illustrated with significant examples. The fundamentally kinetic nature of catalysis is stressed.

The heart of the book is a description of homogeneous catalysis as it is practised today. Fourteen of the two dozen or more major commercial applications of soluble transition metal catalysts are discussed in some detail. The processes described include the reactions of carbon monoxide with acetylenes, olefins and alcohols, the dimerizations of olefins and dienes, and the oxidations of several different types of hydrocarbons. Fundamentally organometallic processes such as the hydrogenation, isomerization, polymerization and metathesis of olefins are also included, even though industry usually chooses heterogeneous catalysts for these