

Powerful techniques at work

Indu Parikh

Affinity Chromatography: A Practical Approach. Edited by P.D.G. Dean, W.S. Johnson and F.A. Middle. *IRL Press: 1985. Pp.215. Pbk £11, \$20.*

Affinity Chromatography: Template Chromatography of Nucleic Acids and Proteins. By Herbert Schott. *Dekker: 1985. Pp.234. \$49.50.*

AFFINITY chromatography has played a key part in the development of molecular biology and biotechnology. Since the technique was described, the number of applications in the biological sciences has grown dramatically. Of the four books and four proceedings of international symposia published to date which deal with the subject, the volume edited by Dean, Johnson and Middle stands out as a uniquely practical guide.

Broadly, the editors have divided their material into three parts: matrix preparation, operational methodologies and quantitative analysis. The section on matrix preparation, which amounts to almost 15 per cent of the text, is rather cluttered with details a biochemist rarely needs. The parts of the book dealing with methodology and quantitative aspects are well written and well organized. A good cross-section of examples and experimental strategies is presented, with sufficient details to illustrate various activation procedures and cross-linking agents for coupling spacers to matrices. Scores of examples of ligand immobilization with superb recipes are scattered throughout the book.

Although a brave attempt has been made to provide adequate bibliographies with original citations, many sections of the book fall down in this regard. But, overall, the editors have successfully brought together a variety of "practical approaches" and produced a most useful and handy package.

Herbert Schott's book is rather different. It is not a manual of recipes, and is limited to nucleic acid research, but is remarkable for its breadth of approach and depth of information. With the upsurge of interest in nucleic acids in general and

Textbooks supplement

Next week's issue of *Nature* includes the annual textbooks supplement, with reviews of some 90 textbooks published over the past year.

Among the books covered are revised editions of the texts by E.R. Kandel and J.H. Schwartz, A. Jolly, B. Lewin, R.W. Old and S.B. Primrose, J. March, P. Atkins and K.E. Bullen, and new publications by M.E. Begon, J.L. Harper and P. Townsend, S. Stanley, A. McBirney, J.R.L. Allen and J.R. Waldram.

nucleic-acid-protein interactions in particular, the appearance of a book dealing specifically with template chromatography of nucleic acids and proteins is timely indeed.

Schott has organized the book in a logical fashion with the most basic system first. Following chapters, in which the procedures and applications become more advanced, build successively on the preceding material. Following an account of immobilization and the use of simple nucleosides and nucleotides, Chapters 2, 3 and 4 describe immobilized oligonucleotides, polynucleotides and nucleic acids. Chapters 5 to 8 deal with the chromatography of DNA and RNA (specifically messenger RNA). The last three chapters, which describe DNA-protein

interactions, are especially good.

Of particular interest to many people is likely to be the isolation of mRNA. Schott devotes an appropriate amount of space to this topic and includes a discussion of the pros and cons of the most commonly used ligands in the isolation of mRNA. The extensive table for specific mRNA, giving sources, how it was purified, and literature references, is particularly helpful.

Finally, an extensive bibliography and an elaborate index are provided. This is a book that will be an invaluable asset to all laboratories engaged in nucleic acid research. □

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Living in the past

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The Burgess Shale. By Harry B. Whittington. *Yale University Press: 1985. Pp.151. \$21, £21.*

LATE in the first decade of this century the former director of the US Geological Survey, Charles D. Walcott, crowned many years of assiduous searching for Cambrian fossils by making one of the most outstanding fossil discoveries ever. In the Burgess Pass in the southern Canadian Rockies, Walcott and his party found not only the usual types of Cambrian fossils with hard-part preservation, such as trilobites, brachiopods and sponges, but a vast variety of well-preserved soft-bodied organisms whose existence had hitherto been unsuspected. Several seasons of collecting yielded an immense number of specimens which were housed in the US National Museum in Washington. Until the late 1960s there they languished, gathering dust and largely undescribed.

Professor Whittington's book on the Burgess Shale fauna summarizes nearly two decades of his concentrated and meticulously thorough research, and that of his students and associates, which has opened a unique window on life on the sea bed early in metazoan history. The soft-bodied or poorly skeletonized fossils, in which there is most interest and which far outnumber those with hard parts, include a large variety of arthropods and worms together with primitive coelenterates and chordates. Not surprisingly, there are some fossils so unlike living organisms that they defy classification. None is more bizarre than the aptly-named *Hallucigenia*, which apparently traversed the sea bed on stilt-like pairs of legs, grasping food by means of a number of tentacles.

The exceptional preservation is the result of an unusual geological event. The

organisms lived on or within the muddy sea bed close to the foot of a submarine cliff formed by a calcareous biogenic reef. A slumping disturbance caused them to be transported suddenly into a deeper, anoxic environment beyond the reach of scavengers, and there the fossils lay undisturbed, exquisitely preserved in shale, until their discovery this century.

As with all scientific advances, as many problems have been posed as solved by research on the Burgess Shale; Whittington's work emphasizes how little we really know about early metazoan life, with its diversity of evolutionary experiment. There is no hint, for example, from any older deposits of how the extensive diversity exhibited by the Burgess Shale fauna developed through time. Why did hard parts appear in certain, but not all, animal groups in the early Cambrian? Could the development of hard parts, valuable for protection and muscle support, be the result of changes in the environment, for example the composition of sea water, or could it perhaps have depended on the evolution of collagen, which is essential for linking muscles to shells? The evolution of some groups such as the brachiopods must have been dependent upon the formation of a hard external skeleton.

Before the publication of this clearly written and well illustrated book, those of us interested in the Burgess Shale fauna were dependent upon either a few brief popular accounts or lengthy technical reports in the specialized literature. Only the reports do full justice to the skill and painstaking efforts that have been called upon to collect, prepare, describe and interpret functionally the various peculiar fossils, but we are indebted to Professor Whittington for now making the research findings of his group so much more accessible. □

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