

Editorial

The Chemical Synthesis of Peptides: a Select Bibliography

Some 10 years ago I published a little book entitled *The Chemical Synthesis of Peptides*. Until quite recently, I entertained thoughts of producing a second edition, but so many good books on peptide synthesis and allied topics have appeared in the interim that I have finally abandoned that idea. However, one feature of my book which attracted positive comment was the bibliography – ambiguous praise, now I reflect on it. Since I have been keeping it up to date, I now use editorial privilege to offer the bibliography alone in the hope that it may be of some use.

INTRODUCTORY

Barrett GC, Elmore DT. *Amino acids and Peptides*. Cambridge University Press: Cambridge, 1999.

Bodanszky M. *Peptide Chemistry* (2nd edn). Springer-Verlag: Berlin, 1993.

Jones J. *Amino Acid and Peptide Synthesis*. Oxford University Press: Oxford (1992, revised 1994, 1997 and 1999). A revised edition in German (translator, Roy K-M) has been published (1995) by VCH, Weinheim.

MORE ADVANCED BROAD-BASED SELECTIVE ACCOUNTS

Bodanszky M. *Principles of Peptide Synthesis* (2nd edn). Springer-Verlag: Berlin, 1993.

Jakubke H-D. *Peptide. Chemie und Biologie*. Spektrum Akademischer Verlag: Heidelberg, 1996.

Lloyd-Williams P, Albericio F, Giralt E. *Chemical Approaches to the Synthesis of Peptides and Proteins*. CRC Press: Boca Raton, FL, 1997.

EXHAUSTIVE GENERAL TREATISES

Greenstein JP, Winitz M. Chemical procedures for the synthesis of peptides. In *Chemistry of the Amino Acids*, vol. 2, Chapter 10. John Wiley & Sons, New York, 1961.

Wünsch E (ed.). *Synthese von Peptiden, Teil I and Synthese von Peptiden, Teil II*, vols. XV/1 and XV/2 of *Methoden der Organischen Chemie (Houben-Weyl)*. Georg Thieme Verlag: Stuttgart, 1974. The successor of this monumental work, Houben-Weyl Vol. E22 (physically actually to be three volumes) is in the press.

Schröder E, Lübke K. *The Peptides* (in two volumes: *Methods of peptide synthesis* (vol. 1); *Synthesis, occurrence and action of biologically active peptides* (vol. 2)). Academic Press: London, 1965.

BOOKS ON SPECIFIC ASPECTS AND RELATED TOPICS

Barrett GC (ed.). *Chemistry and Biochemistry of the Amino Acids*. Chapman and Hall: London, 1985.

Borchardt RT, Freidinger RM, Sawyer TK, Smith PL (eds). *Integration of Pharmaceutical Discovery and Development. Case Histories*. Plenum Press: New York, 1998. [Most of the case histories reviewed are peptide-related.]

Dutta AS. *Small Peptides. Chemistry, Biology and Clinical Studies*. Elsevier: Amsterdam, 1993.

Grant GA (ed.). *Synthetic Peptides. A User's Guide*. WH Freeman & Co, New York, 1992. [This valuable book has a slightly puzzling title: actually two-thirds of it is really a guide for *producers* rather than *users*. Its chapters *Evaluation of the finished product* and *Setting up a core facility* are of particular interest.]

Gross E, Meienhofer J (eds). *Major Methods of Peptide Bond Formation. The Peptides*, vol. 1. Academic Press: New York, 1979.

Gross E, Meienhofer J (eds). *Special Methods in Peptide Synthesis, Part A. The Peptides*, vol. 2. Academic Press: New York, 1980.

Gross E, Meienhofer J (eds). *Special Methods in Peptide Synthesis, Part B. The Peptides*, vol. 9. Academic Press: New York, 1983.

Gutte B (ed.). *Peptides. Synthesis, Structures and Applications*. Academic Press: New York, 1995.

Hecht SM (ed.). *Bioorganic Chemistry: Peptides and Proteins*. Oxford: Oxford University Press, 1998.

Juaristi E (ed.). *Enantioselective Synthesis of β -Amino Acids*. Wiley-VCH: New York, 1997.

Jung G (ed.). *Peptide and Nonpeptide Combinatorial Libraries. A Handbook*. VCH: Weinheim, 1996.

Kocienski PJ. *Protecting Groups*. Georg Thieme Verlag: Stuttgart, 1994.

König W. *Peptide and Protein Hormones*. VCH: Weinheim, 1992.

Kullman W. *Enzymatic Peptide Synthesis*. CRC Press: Boca Raton, FL, 1987.

Large DG, Warren CD (eds). *Glycopeptides and Related Compounds*. Marcel Dekker: New York, 1997.

Offord RE. *Semisynthetic Proteins*. John Wiley & Sons: Chichester, 1980.

Scopes RK. *Protein Purification: Principles and Practice* (3rd edn). Springer-Verlag: New York, 1994.

Strand FL. *Neuropeptides*. MIT Press: Cambridge, MA, 1999.

Udenfriend S, Meienhofer J (eds). *Special Methods in Peptide Synthesis, Part C. The Peptides*, vol. 9. Academic Press: New York, 1987.

Ward DJ (ed.). *Peptide Pharmaceuticals. Approaches to the Design of Novel Drugs*. Open University Press: Milton Keynes, UK, 1991.

Williams RM. *Synthesis of Optically Active α -Amino Acids*. Pergamon Press: Oxford, 1989. For an updating review, see Duthaler RO. *Tetrahedron* 1994; **50**: 1539–1650.

Zabicky J (ed.). *The Chemistry of Amides*. A volume in the series *The Chemistry of Functional Groups* (Patai S, ed.). Interscience Publishers: London, 1970.

The β -lactam antibiotics are peptides of a kind, so their chemistry, especially that of their synthesis, has many features which overlap with mainstream peptide chemistry:

Georg GI (ed.). *The Organic Chemistry of β -Lactams*. VCH: Weinheim, 1993.

Page MI (ed.). *The Chemistry of β -Lactams*. Blackie Academic and Professional (Chapman & Hall): London, 1992.

HISTORICAL

Fischer E. *Aus meinem Leben*. Springer-Verlag: Berlin, 1922, reprinted 1987 with a Prologue and Epilogue in English by B. Witkop.

Merrifield [R]B. *Life During a Golden Age of Peptide Chemistry*. American Chemical Society: Washington, DC, 1993.

Wieland T. The history of peptide chemistry. Chapter 1 in Gutte, 1995, *op. cit.*

Wieland T. Memories of Heidelberg and of other places. *Comprehensive Biochem.* 1995; **38**: 21–108.

Wieland T, Bodanszky M. *The World of Peptides. A Brief History of Peptide Chemistry*. Springer-Verlag: Berlin, 1991. [An interesting and sound account of the early days, but very unbalanced in its treatment of later developments.]

Sheppard RC (ed.). *Peptide Chemistry at the Medical Research Council Laboratory of Molecular Biology, Cambridge*. Printed for private circulation, Cambridge, 1997.

Zahn H. My journey from wool research to insulin. *J. Peptide Sci.* 2000 (in press).

FESTSCHRIFTEN

There have been three collections of essays and lectures in honour of distinguished leaders in the field which are of particular value:

Eberle A, Geiger R, Wieland T (eds). *Perspectives in Peptide Chemistry*. S. Karger: Basel, 1981 [in honour of Robert Schwyzler].

Katsoyannis PG (ed.). *The Chemistry of Polypeptides*. Plenum Press: New York, 1973 [in honour of Leonidas Zervas].

Voelter W, Fischer G (eds). Future aspects in peptide chemistry. *Collection Symposium Series*, **1**, 1999 [in honour of Erich Wünsch].

Other festschriften have been more by way of collections of primary literature papers: *Int. J. Peptide Protein Res.* 1992; **40**(3/4), Tam JP, Hraby VJ (guest eds) [in honour of Bruce Merrifield]; *J. Med. Chem.* 1992; **35**(21), Rich DH (guest ed.) [in honour of Ralph Hirschmann].

REVIEWS

Journals and serial publications such as the *Journal of Peptide Science*, *Biopolymers* (Peptide Science), *Perspectives in Drug Design and Discovery*, *Synthesis*, *Angewandte Chemie*, and the late *International Journal of Peptide and Protein Research* (now the *Journal of Peptide Research*) carry authoritative reviews of relevant topics from time to time. Most are fairly closely-focussed, but the following more wide-ranging reviews are worthy of special note.

Bayer E. Towards the chemical synthesis of proteins. *Angewandte Chemie* (International Edition in English) 1991; **30**: 113–129.

Barany G, Kneib-Cordonier N, Mullen DG. Solid-phase peptide synthesis: a silver anniversary report. *International J. Peptide Protein Res.* 1987; **30**: 705–739.

Benz H. The role of solid-phase fragment condensation (SPFC) in peptide synthesis. *Synthesis*, 1994; 337–358.

Bodanszky M, Martinez J. Side reactions in peptide synthesis. *Synthesis* 1981; 333–356.

Fields GB, Noble RL. Solid phase peptide synthesis utilizing 9-fluorenylmethoxy-carbonyl amino acids. [A more general review than the title suggests]. *Int. J. Peptide Protein Res.* 1990; **35**: 161–214.

Gante J. Peptidomimetics-tailored enzyme inhibitors. *Angewandte Chemie* (International Edition in English) 1994; **33**: 1699–1720.

Hirschmann R. Medicinal chemistry in the golden age of biology: lessons from steroid and peptide research. *Angewandte Chemie* (International Edition in English) 1991; **30**: 1278–1301.

Humphrey JM, Chamberlin AR. Chemical synthesis of natural product peptides: coupling methods for the incorporation of noncoded amino acids into peptides. *Chem. Rev.*, 1997; **97**: 2243–2266.

James IW. Linkers for solid phase organic synthesis. *Tetrahedron*, 1999; **55**: 4855–4946.

Jung G, Beck-Sickinger AG. Multiple peptide synthesis methods and their applications. *Angewandte Chemie* (International Edition in English) 1992; **31**: 367–383.

Lloyd-Williams P, Albericio F, Giralt E. Convergent solid-phase peptide synthesis. *Tetrahedron* 1993; **49**: 11065–11133.

Patek M. Multistep deprotection for peptide chemistry. *Int. J. Peptide Protein Res.* 1993; **42**: 97–117.

Sakakibara S. Synthesis of large peptides in solution. *Biopolymers (Peptide Sci.)* 1994; **37**: 17–20.

Schelhaas M, Waldemann H. Protecting group strategies in organic synthesis. *Angewandte Chemie* (International Edition in English) 1996; **35**: 2056–2083.

Schellenberger V, Jakubke H-D. Protease-catalysed kinetically controlled peptide synthesis. *Angewandte Chemie* (International Edition in English), 1991; **30**: 1437–1449.

Sheppard RC. A cycle of solid phase synthesis. The 5th Josef Rudinger Memorial Lecture. In *Peptides 1994* (Maia, *op.cit.*, below), 1995, pp. 3–17.

EXHAUSTIVE COMPILATIONS

Davies JS (ed.). *Amino Acids and Peptides*. Chapman and Hall: London, 1985. [A sourcebook largely derived from the *Dictionary of Organic Compounds* (5th edn).]

Fletcher GA, Jones JH. A list of amino-acid derivatives which are useful in peptide synthesis. *International Journal of Peptide and Protein Research* 1972; **4**: 347–371. [For Supplements see *ibid*, 1975; **7**., 91–102 and 1985; **25**: 213–223. Helpful lists of derivatives are also to be found in several other places: for Fmoc derivatives see especially Fields and Noble, *op.cit.* above and Atherton and Sheppard, *op.cit.* below.]

Greene TW, Wuts PGM. *Protective Groups in Organic Synthesis* (3rd edn). Wiley-Interscience: New York, 1999.

PRACTICAL GUIDES

Anon. *Introduction to Cleavage Techniques*. Applied Biosystems: Warrington, UK, 1990.

Anon. *The Busy Researcher's Guide to Biomolecule Chromatography*. PerSeptive Biosystems: Framingham, MA, 1996.

Atherton E, Sheppard RC. *Solid Phase Peptide Synthesis: A Practical Approach*. IRL Press at Oxford University Press: Oxford, 1989.

Bodanszky M, Bodanszky A, Trost B. *The Practice of Peptide Synthesis* (2nd edn). Springer-Verlag: Berlin, 1994.

Chan WC, White PD. *Fmoc Solid Phase Peptide Synthesis: A Practical Approach*. Oxford University Press: Oxford, 2000 [the successor to the above].

Chapman JR (ed.). *Protein and Peptide Analysis by Mass Spectrometry*. Humana Press: Totowa, NJ, 1996.

Fields GB (ed.). *Solid-phase Peptide Synthesis*. Academic Press: New York, 1997.

Synthesis notes. Appended to the 1994/95 Novabiochem catalogue; revised and extended anonymously in later editions. Calbiochem-Novabiochem (UK) Ltd: Nottingham, 1994.

Hancock WS (ed.). *CRC Handbook of HPLC for the Separation of Amino Acids, Peptides and Proteins*, in two volumes. CRC Press: Boca Raton, FL, 1984.

Irvine GB, Williams CH (eds). *Neuropeptide Protocols*. Humana Press: Totowa, NJ, 1997. [Techniques of relevance to peptides generally, not only neuropeptides, are covered.]

Kazimierski WM (ed.). *Peptidomimetics Protocols*. Humana Press, Totowa, NJ, 1999.

Pennington MW, Dunn BM. *Peptide Synthesis Protocols*. Humana Press: Totowa, NJ, 1994.

Pennington MW, Dunn BM. *Peptide Analysis Protocols*. Humana Press: Totowa, NJ, 1994. [Some peptide synthesis topics are also covered.]

Smith BJ (ed.). *Protein Sequencing Protocols*. Humana Press: Totowa, NJ, 1997.

Stewart JM, Young JD. *Solid Phase Peptide Synthesis* (2nd edn). Pierce Chemical Company: Rockford, IL, 1984.

Wisdom GB (ed.). *Peptide Antigens: A Practical Approach*. IRL Press at Oxford University Press: Oxford, 1994.

INTERNATIONAL PEPTIDE SYMPOSIA

There are four major series of international symposia dealing with peptide chemistry and closely allied topics: the European, Japanese, and American Peptide Symposia, organized under the auspices of the European, Japanese and American Peptide Societies, and the Epton Symposia. Their proceedings, which are listed below, are all very important in the field. There are also several other less well-established series, and every year several relevant *ad hoc* symposia take place: no attempt has been made to cover them here.

The European Peptide Symposia

1st Symposium, Prague, 1958. *Collection Czechoslovak Chemical Communications* 1959; **24**: 1–160.

2nd Symposium, Munich, 1959. *Angewandte Chemie* 1959; **71**: 741–743.

3rd Symposium, Basel, 1960. *Chimia* 1960; **14**: 366–380, 393–418.

4th Symposium, Moscow, 1961. *Collection of Czechoslovak Chemical Communications* 1962; **27**: 2229–2262.

5th Symposium, Oxford, UK, 1962. Young GT (ed.). *Peptides*. Pergamon Press: Oxford, 1963.

6th Symposium, Athens, 1963. Zervas L (ed.). *Peptides*. Pergamon Press: Oxford, 1966.

7th Symposium, Budapest, 1964. *Acta Chimica Academiae Scientiarum Hungaricae* 1965; **44**: 1–239.

8th Symposium, Noordwijk, The Netherlands, 1966. Beyerman HC, van de Linde A, Maassen van den Brink W (eds). *Peptides*. North-Holland Publishing Company: Amsterdam, 1967.

9th Symposium, Orsay, France, 1968. Bricas E (ed.). *Peptides 1968*. North-Holland Publishing Company: Amsterdam, 1968.

10th Symposium, Abano Terme, Italy, 1969. Scoffone E (ed.). *Peptides 1969*. North-Holland Publishing Company: Amsterdam, 1971.

11th Symposium, Vienna, 1971. Nesvadba H (ed.). *Peptides 1971*. North-Holland Publishing Company: Amsterdam, 1971.

12th Symposium, Reinhardsbrunn Castle, Germany, 1972. Hanson H, Jakubke H-D (eds). *Peptides 1972*. North-Holland Publishing Company: Amsterdam, 1973.

13th Symposium, Kiryat Anavim, Israel, 1974. Wolman Y. *Peptides 1974*. John Wiley & Sons: New York, 1975.

14th Symposium, Wépion, Belgium, 1976. Loffet A (ed.). *Peptides 1976*. Editions de l'Université de Bruxelles: Brussels, 1975.

15th Symposium, Gdansk, 1978. Siemion IZ, Kupryszewski G (eds). *Peptides 1978*. Wrocław University Press: Wrocław, 1979.

16th Symposium, Helsingør, Denmark, 1980. Brunfeldt K (ed.). *Peptides 1980*. Scriptor: Copenhagen, 1981.

17th Symposium, Prague, 1982. Bláha K, Malon P (eds). *Peptides 1982*. Walter de Gruyter: Berlin, 1983.

18th Symposium, Djurönäset, Sweden, 1984. Ragnarsson U (ed.). *Peptides 1984*. Almquist & Wiksell International: Stockholm, 1984.

19th Symposium, Porto Carras, Chaldiki, Greece, 1986. Theodoropoulos D (ed.). *Peptides 1986*. Walter de Gruyter: Berlin, 1987.

20th Symposium, Tübingen, Germany, 1988. Jung G, Bayer E (eds). *Peptides 1988*. Walter de Gruyter: Berlin, 1989.

21st Symposium, Platja D'Aro, Spain, 1990. Giralt E, Andreu D (eds). *Peptides 1990*. ESCOM Science Publishers: Leiden, 1991.

22nd Symposium, Interlaken, Switzerland, 1992. Schneider CH, Eberle AN (eds). *Peptides 1992*. ESCOM Science Publishers: Leiden, 1993.

23rd Symposium, Braga, Portugal, 1994. Maia HLS (ed.). *Peptides 1994*. ESCOM Science Publishers: Leiden, 1995.

24th Symposium, Edinburgh, UK, 1996. Ramage R, Epton R (eds). *Peptides 1996*. Mayflower Scientific Ltd.: Kingswinford, UK, 1998.

25th Symposium, Budapest, 1998. Bajusz S, Hudecz F (eds). *Peptides 1998*. Akadémiai Kiadó: Budapest, 1999.

The Japanese Peptide Symposia

25th Symposium, Kobe, 1987. [This was the first Symposium in the series to be designated 'International']. Shiba T, Sakakibara S (eds). *Peptide chemistry 1987*. Protein Research Foundation: Osaka, 1988.

26th Symposium, Tokyo, 1988. Ueki M (ed.). *Peptide Chemistry 1988*. Protein Research Foundation: Osaka, 1989.

27th Symposium, 1989. Yanaihara N (ed.). *Peptide Chemistry 1989*. Protein Research Foundation: Osaka, 1989.

28th Symposium, 1990. Shimonishi Y (ed.). *Peptide Chemistry 1990*. Protein Research Foundation: Osaka, 1991.

29th Symposium, Tokyo, 1991. Suzuki A (ed.). *Peptide Chemistry 1991*. Protein Research Foundation: Osaka, 1992.

30th Symposium, Shizuoka, 1992. [This was the second Symposium in the series to be designated 'International']. Yanaihara N (ed.). *Peptide Chemistry 1992*. ESCOM Science Publishers: Leiden, 1993.

31st Symposium, Akashi, Kobe, 1993. Okada Y (ed.). *Peptide Chemistry 1993*. Protein Research Foundation: Osaka, 1994.

32nd Symposium, Fukuoka, 1994. Ohno M (ed.). *Peptide Chemistry 1994*. Protein Research Foundation: Osaka, 1995.

33rd Symposium, Sapporo, Hokkaido, 1995. Nishi N (ed.). *Peptide Chemistry 1995*. Protein Research Foundation: Osaka, 1996.

34th Symposium, Tsukuba, 1996. Kitada C (ed.). *Peptide Chemistry 1996*. Protein Research Foundation: Osaka, 1997.

Japanese Peptide Symposium, Kyoto, 1997: designated the 1st International Peptide Symposium. Shimonishi Y (ed.). *Peptide Science – Present and Future*. Kluwer Academic Publishers: Dordrecht, 1999.

35th Symposium, Saga, 1998. Kondo M (ed.). *Peptide Science 1998*. Protein Research Foundation: Osaka, 1999.

[36th Symposium, Kyoto, 1999.]

The American Peptide Symposia

1st Symposium, Yale, 1968. Weinstein B, Lande S (eds). *Peptides: Chemistry and Biochemistry*. Marcel Dekker: New York, 1970.

2nd Symposium, Cleveland, 1970. Lande S (ed.). *Progress in Peptide Research*. Gordon and Breach: New York, 1972.

3rd Symposium, Boston, 1972. Meienhofer J (ed.). *Chemistry and Biology of Peptides*. Ann Arbor Science Publishers: Ann Arbor, MI, 1994.

4th Symposium, New York, 1975. Walter R, Meienhofer J (eds). *Peptides: Chemistry, Structure and Biology*. Ann Arbor Science Publishers: Ann Arbor, MI, 1976.

5th Symposium, San Diego, 1977. Goodman M, Meienhofer J (eds). *Peptides*. Halstead Press: New York, 1977.

6th Symposium, Washington DC, 1979. Gross E, Meienhofer J (eds). *Peptides: Structure and Biological Function*. Pierce Chemical Company: Rockford, IL, 1979.

7th Symposium, Madison, WI, 1981. Gross E, Rich DH (eds). *Peptides: Synthesis, Structure, Function*. Pierce Chemical Company: Rockford, IL, 1982.

8th Symposium, Tucson, AZ, 1983. Hruby VJ, Rich DH (eds). *Peptides: Structure and Function*. Pierce Chemical Company: Rockford, IL, 1983.

9th Symposium, Toronto, 1985. Deber CM, Hruby VJ, Kopple KD (eds). *Peptides: Structure and Function*. Pierce Chemical Company: Rockford, IL, 1985.

10th Symposium, St. Louis, 1987. Marshall GR (ed.). *Peptides: Chemistry and Biology*. ESCOM Science Publishers: Leiden, 1988.

11th Symposium, La Jolla, California, 1989. Rivier JE, Marshall GR (eds). *Peptides: Chemistry, Structure and Biology*. ESCOM Science Publishers: Leiden, 1990.

12th Symposium, Boston, MA, 1991. Smith JA, Rivier JE (eds). *Peptides: Chemistry and Biology*. ESCOM Science Publishers: Leiden, 1993.

13th Symposium, Edmonton, Alberta, 1993. Hodges RS, Smith JA (eds). *Peptides: Chemistry, Structure and Biology*. ESCOM Science Publishers: Leiden, 1994.

14th Symposium, Columbus, Ohio, 1995. Kaumaya PTP, Hodges RS (eds). *Peptides: Chemistry, Structure and Biology*. Mayflower Scientific Ltd: UK, 1996.

15th Symposium, Nashville, TN, 1997. Tam JP, Kaumaya PTP (eds). *Frontiers of Peptide Science*. Kluwer Academic Publishers: Dordrecht, 1999.

[16th Symposium, Minneapolis, 1999.]

The Epton Symposia

1st Symposium, Oxford, 1989. Epton R (ed.). *Innovation and Perspectives in Solid Phase Synthesis*. SPCC (UK) Ltd.: Birmingham, UK, 1990.

2nd Symposium, Canterbury, 1991. Epton R (ed.). *Innovation and perspectives in solid phase synthesis*. Intercept: Andover, UK, 1992.

3rd Symposium, Oxford, 1993. Epton R (ed.). *Innovation and Perspectives in Solid Phase Synthesis*. Mayflower Worldwide Ltd: Birmingham, UK, 1994.

4th Symposium, Edinburgh, 1995. Epton R (ed.). *Innovation and Perspectives in Solid Phase Synthesis and Combinatorial Libraries*. Mayflower Scientific Ltd.: Birmingham, UK, 1996.

5th Symposium, London, 1997. Epton R (ed.). *Innovation and Perspectives in Solid Phase Synthesis*

and Combinatorial Libraries. Mayflower Scientific Ltd: Birmingham, UK, 1998.

[6th Symposium, York, 1999.]

ANNUAL REVIEWS

Annual reviews of amino-acid, peptide and protein chemistry have been published by the Chemical Society (Royal Society of Chemistry from vol. 11), London, since 1969 (vol. 1 covering 1968 literature, and so on), in its *Specialist Periodical Reports* series, with GT Young (vols. 1–4), RC Sheppard (vols. 5–13), JH Jones (vols. 14–23), and JS Davies (vols. 24–) as successive 'Senior Reporters' (i.e. eds).

CURRENT AFFAIRS IN THE FIELD

The European Peptide Society produces a regular Newsletter which includes information about forthcoming meetings, relevant books and other matters of interest to its members. The web pages of the European and American Peptide Societies are also very informative, and can be used as an entry into Internet resources, which are increasingly extensive and useful.

J.H. JONES
Balliol College, Oxford, UK