

# Introduction

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Following the retirements of long serving authors reported in the introduction to volume 28, we have to note further changes to the team. After acting as Senior Reporter since volume 15, Brian Walker has now relinquished this role, which has been taken on by John Tebby. Happily, Brian continues as an author, now contributing the 'Quinquevalent Phosphorus Acids' chapter instead of the 'Ylides and Related Compounds' chapter which he has written since volume 13! We also have to note with regret that Otto Dahl has decided to retire from authorship of the 'Tervalent Phosphorus Acid Derivatives' chapter, having also contributed since volume 15. We thank Brian and Otto for sustained comprehensive and critical writing in these areas over many years. We are delighted to report that Terry Kee has agreed to take over Otto Dahl's chapter in the next volume. Sadly, this will also be the final volume to which Jane Grasby and David Williams will contribute the 'Nucleotides and Nucleic Acids' chapter, and we thank them for their efforts over the last four years. On a brighter note, we welcome Neil Bricklebank as the new author of the 'Ylides and Related Compounds' chapter, J. C. Van der Grampel as the new author of the 'Phosphazenes' chapter, and also Mike Salt joins Robert Slinn as the co-author of the 'Physical Methods' chapter.

Activity in the area covered by the 'Phosphines and Phosphonium Salts' chapter, which also covers the chemistry of low coordinate  $p\pi$  bonded compounds, has continued at a high level, particularly with regard to the synthesis of new phosphines, although without major advances, doubtless reflecting the relative maturity of the area. Similarly, nothing of great note has emerged in the trivalent phosphorus acid derivatives area. The same, perhaps, could also be said of the area of ylide chemistry, although the application of phosphorus-based ylides in general synthetic chemistry continues unabated, and Warren's group, in particular, has continued to develop the chemistry of phosphine oxide-based ylides.

This year's literature on nucleotide and nucleic acid chemistry has been dominated by interest in internucleoside linkages, and a number of novel approaches in this area have been described. In some cases, these have also extended to oligonucleotides. Some novel nucleotide analogues have been described. One of the most exciting areas in nucleic acid chemistry is the application of in-vitro selection techniques, and these have been reviewed for the first time.

Biological chemistry and its needs increasingly dominate the phosphorus(v) acids' area and the majority of novel results relate to compounds derived from phosphonic and phosphinic, rather than phosphoric acids. Numbers of studies of compounds related to inositol and to carbohydrates continue to appear, although few contain truly novel results. Phosphorus-containing analogues of amino acids

and peptides of a wide variety of types continue to be of interest, as do phosphate isosteres, particularly those containing fluoro- or difluoro-methyl groups. Some new methods of synthesis of fluoroalkyl phosphorus compounds have been reported but more convenient methods are still urgently required. The number of reports of enantioselective and asymmetric synthesis, often but not exclusively involving P-stabilised carbanions, continues to increase. There is a growing interest in  $\alpha$ -ketophosphonates and the number of three-membered phosphorus-containing rings implicated as reactive intermediates continues to expand.

In the hypervalent area of phosphorus chemistry a configurationally stable tris(tetrachlorobenediolato) phosphate ion has been synthesised. The growing importance of hydridophosphoranes in coordination chemistry has led to the appearance of a useful review. The superbases properties of the commercially available proazaphosphatane has been extended to the catalysis of the silylation of sterically hindered alcohols and phenols.

The almost inexhaustible number of applications for phosphazenes ensures that interest in this area continues to be strong. Polyphosphazenes are playing an important role in the preparation of new block copolymers and in grafting processes, leading to extended applications in the production of flame retardants, membranes, hydrogels and to drug delivery polymers. The complexation of phosphazenes with a wide range of transition metals continue to be exploited. Studies of phosphazenes in organic synthesis have extended their usefulness, *e.g.* to the synthesis of pyridines. Their selectivity in clathrate formation with arenes is an interesting development. The multifunctionality of cyclophosphazenes continues to be exploited as starting materials for the preparation of polyodants and various dendrimers (up to 8th generation).

In physical and theoretical methods there has been a notable increase in the use of recently developed techniques – most of which have trendy acronyms. Thus DRAMA  $^{31}\text{P}$  NMR has been used to determine internuclear P–P distance in a phosphine sulfide 4,8-residue substituted decapeptide, and XANES has been applied to structural studies of phosphine selenides. In the mass spectral field MALDI-TOF has been found to be better than FAB for the determination of the mass spectra of nucleotide triphosphates, LA-FTICR has been used to study tris(cyanoethyl)phosphine and metaphosphates have been detected for the first time by laser photoionisation MS. ERMS was shown to be a powerful technique for the analysis of structurally similar organophosphate insecticides (OPs) and trace quantities of OPs can be determined by CI using water as the ionising agent.

The 14th International Conference on Organophosphorus Chemistry (ICPCXIV), held in Cincinnati from 12 to 17 July, 1998, was highly successful and enjoyable. Cincinnati, bordered by the Ohio river, is of a manageable size and has a variety of cultural attractions, friendly people and good, cheap public transport. The enormous range of organic, inorganic and biological chemistry together with materials science covered in 240 oral presentations and 300 posters offered something of interest for everyone of the 550 participants. The biological and biologically related chemistry sessions provided the majority of the truly novel results, while the traditional organic chemistry sessions were somewhat disappointing overall. We look forward to ICPCXV in Japan in 2001.