*Carbohydrate Polymers* 1 (1981) 1

# EDITORIAL

It is fortunately not necessary at the birth of a new child for the parents to justify the presence of the bundle of life in their arms which declares its existence with lusty cries. Such is not the case with a new journal. Rather more sharply drawn, if rarely stated, criteria are used by the scientific community to test the validity of any addition to the population of scientific journals. After all, it is argued, library shelves are already crowded and further additions must ruthlessly compete not only for space but also for an allocation from static library budgets.

What then is the rationale behind the launching of *Carbohydrate Polymers*?

It is, we believe, the consequence of a pressing scientific need. We hasten, however, to pay tribute to the superb pioneering work of our senior sister journal, *Carbohydrate Research*, which has established a world-wide prestige and influence in the general field of carbohydrate chemistry and biochemistry. Many outstanding advances have been reported in its pages. However, a distinct and growing area of scientific endeavour has emerged relating to the use of carbohydrate polymers, the results of which either would not reside comfortably within the covers of *Carbohydrate Research* or which, presently, are disseminated over a number of apparently unrelated journals. To gather this information together would in the minds of the editors and editorial board, provide a considerable and positive benefit to those working in the field and furnish a more surely serviced literature base from which to launch subsequent research investigations. This, then, is our *raison d'être.*

Perhaps it is not inappropriate to stand back for a moment and survey the field and also ask ourselves the questions, how important are these carbohydrate polymers, what are their future prospects and what progress has the research scientist made in their study and use?

In answer to the first question, we confess that a materials list can sound inordinately prosaic: cellulose, hemicelluloses, pectins, gums, mucilages, starch,



*Carbohydrate Polymers* (1) (1981)–

glycogen, lignin, chitosan and others. Such a list by its very familiarity can numb the mind so that it overlooks some of the brilliant research which has been done with these materials in the past decade. Nevertheless, their familiarity, at least in general terms, reminds us that these are the primary products of the photosynthetic process manufactured in staggering bulk each year all over the face of planet Earth and it is *these* materials which function as the major energy currency reserve of solar energy. Likewise these are the polymers which nature uses to develop the amazing architecture of much of the plant kingdom and to protect the insects and crustaceans. The former are the major source of metabolisable energy, not only for mankind, but for herbivores generally, whether they be vertebrates, arthropods or annelids. And it is these materials which are converted to the fossil fuels on which our society is all too dependent.

We are not wise enough or brave enough to predict the technological future in any detail, but in the current climate can anybody deny that the potential for the world's largest class of renewable raw materials must be immense? Not only may we expect to see an increase in the range of uses for the current commercially available carbohydrate polymers, but we envisage the appearance of an increasing variety of new polysaccharides formed both by microbial processes and by chemical modification of existing materials.

Within the time scale of a lifetime the world's oil resources will be close to exhaustion. This will surely increase the importance of carbohydrate polymers. They can be expected to play a significant role in oil recovery as less accessible sources have to be tapped and we can also envisage, in some circumstances, plant materials consisting mainly of polysaccharides becoming a significant energy source. More speculatively there may come a time when modified carbohydrate polymers become the basis of a new plastics industry as feedstocks derived from oil become increasingly expensive.

The food industry which has concentrated much of its research on protein biochemistry and technology is beginning to display a deeper interest in exploiting the polysaccharide constituents either for the food itself, or in the form of additives to develop new and improved textures. As the mind wanders over the use of polysaccharides at present, textiles, the wood industry and its by-products, paper production, pharmaceutical products, chemical processing industry and so on, one can see that the prospects are enormous.

It is, however, encouraging to remind ourselves of the progress that has been made. There have been the elegant studies that have elucidated the chemical and three-dimensional structures of the carrageenans, alginates, hyaluronic acid, dextran, $\alpha$- and $\beta$-amyloses and many others in recent years. Biosynthetic studies have followed. But the exploitation of these polymeric systems poses fascinating questions not only for the biochemist, chemist, physicist but also for the engineer. For example, classical physical chemistry has concentrated on dilute solutions which are a far cry from most living systems, food products, paper production and the like. Now the field is rapidly

developing and through the work of colleagues in this synthetic polymer field, an understanding is growing of concentrated systems. Such a knowledge should permit us to modify and manipulate polysaccharide systems more surely in what at first sight may appear to be very different areas of technology and industry.

We have been encouraged by the interest and support already generated by colleagues world-wide and trust that this initial response will be continued. A journal such as this is, of course, very much the product of those who read it and submit papers for publication. We are therefore glad to receive not only papers but any suggestions for modifications and additions which will improve the value of the journal to the reader, develop our understanding of these polysaccharide systems and foster the dissemination of such information to the scientific community at large.

J. M. V. Blanshard
J. R. Mitchell