

Elmerich, C., Kondorosi, A., Newton, W.E. (ed.): **Biological Nitrogen Fixation for the 21<sup>st</sup> Century** (Proceedings of the 11<sup>th</sup> International Congress on Nitrogen Fixation, Paris 1997) - Kluwer Academic Publishers, Dordrecht - Boston - London 1998. 708 pp. NLG 500.00. ISBN 0-7923-4834-6.

Today, it is difficult to be oriented in the field of biological nitrogen fixation (BNF) and hardly anybody is able to cover all its aspects. BNF includes topics ranging from the biophysical processes during reduction of molecular nitrogen by nitrogenase to the field trials of new legume cultivars with elevated symbiotic efficiency. Fortunately, once two or three years, a straw arrives to clutch at in the form of regularly issued books which are composed of the communications presented at the international congresses on nitrogen fixation. These highly representative meetings stopped over in Europe (10<sup>th</sup> St. Petersburg 1995, 11<sup>th</sup> Paris 1997) after two meetings on the America continent (8<sup>th</sup> Knoxville 1990, 9<sup>th</sup> Cancún 1992) before leaving Europe again (Foz do Iguaçu 1999).

It has become a tradition that these collections serve as a guide book for the orientation in the tangle of ongoing research programs in the subfields of nonsymbiotic and symbiotic nitrogen fixation as well as an abundantly cited source of primary information. Also this has been impatiently awaited, especially by non-participants of the congress, and confirmed the previous high standard of this series. Like the proceedings of the two previous congresses, the book has been included into the publisher's series "Current Plant Science and Biotechnology in Agriculture". The division of the book comprises all basic directions of the BNF research, namely chemistry and biochemistry of nitrogenase, genetics and regulation of *nif* genes, nitrogen fixation in photoautotrophs, *Rhizobium*-legume symbiosis, genetics of host plants, actinorhizal symbiosis, root-associated diazotrophs, physiology of fixing plants, and the taxonomy and phylogeny of diazotrophs. A significant part of the congress was devoted to the key role of BNF in the sustainable agriculture and forestry. The amount of the gathered material is characterized by the figures of 130 lectures and 350 poster summaries. The comparison with the previous volume allows to reveal contemporary trends in the development of this area. Although an increase in the percentage of contributions dealing predominantly with the plant hosts is not significant (from 26.2 to 29.5 %), it appears that the role of leguminous hosts attracts more and more attention, at least in the subfield of symbiotic nitrogen fixation. Such a shift is not surprising. The knowledge of bacterial nodulation factors advanced so much that it allows to start the search for rules of co-evolution of the Nod factor structure and legume hosts, as reviewed by Yang *et al.*, and a symbiotic megaplasmid of a model strain *Rhizobium* NGR234 has been completely sequenced (Perret *et al.*). Obviously, the challenge is now coming from the side of the plant host. Certain contributions indicate (*e.g.* Sautter) that a frontal attack on the long-term strategic goal of the BNF research, *i.e.*, the extension of the ability of rhizobial symbiosis formation with associated nitrogen autotrophy to the main crops, which are unfortunately nonlegumes, has already started.

This collection of reports is obviously predestined to become a reference book for all plant biologists, breeders and microbiologists in the field of BNF who wish that their project correspond to the state-of-the-art as far as possible. The book also provides a comprehensive survey of BNF for scientists from adjacent fields. One would wish that publications of this type serve as a basic source of information for the research granting bodies since they could be extremely helpful in the evaluation of future directions of research.

K. NOVÁK (*Praha*)