Preface

Structural changes occur in the nervous system during development and aging, in cases of disease and pharmacological treatment, as a result of environmental influences or other experimental conditions. For quantitative assessment morphometry and stereology offer us indispensable tools for estimating the type and size of these structural changes. This is of importance for biological concepts; to reveal the occurrence of alterations in, e.g., neuronal cell numbers and neuronal cell size, and, e.g., for the interpretation as to whether or not size differences in a particular brain region, given its relations with brain and body size, are really sexually dimorphic, or a specific result of an experimental effect.

Morphometry is commonly defined as a set of methods to estimate structural quantities. The concept of stereology is less known and may be defined as a set of methods through which unbiased estimations can be derived of 3-dimensional structural quantities on the basis of 2-dimensional sections through specimens. Stereology is therefore a branch of morphometry. In the last 5 years many new stereological and morphometric methods have been developed, some of which may well be referred to as 'real breakthroughs'. Morphometric methods are used at an increasing rate in neurosciences, and the selection of appropriate methods may well be decisive for the outcome of the analysis. This special issue on '*Morphometry and Stereology in the Neurosciences*' was therefore designed to give a survey of the present 'state-of-the-art'. Difficult mathematical terminology has been avoided where possible, and emphasis was put on practical applications in neuroscience research with a certain amount of theoretical background. This publication is one of the results of the international practical course on 'Morphometry and Stereology in Neurosciences' (May 20–24, 1985), organized by the Netherlands Institute for Brain Research and the Netherlands Ophthalmic Research Institute, under the auspices of the International Brain Research Organization (IBRO) and the International Society for Stereology (ISS). This practical course was made possible by financial support from IBRO and the C.N. van den Houten fund, and Digital Equipment Corporation (Utrecht), IBM Nederland NV (Amsterdam), ISS, Laméris Laboratorium BV (Utrecht), Philips NV (Eindhoven), Foundation 'Remmert Adriaan Laan', and Zeiss Nederland BV (Weesp). All chapters have been critically evaluated by independent referees. We hope that this special issue will contribute to the careful application of morphometric and stereological methods in the neurosciences.

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