

## PREFACE

At a paediatric cardiology meeting decades ago, the veterinarian D.F. Patterson gave a presentation on canine cardiac defects. At that time, human cardiologists knew very little about congenital heart malformations in animals. Until today, textbooks in paediatric cardiology include only a few lines, if at all, on isolated observations in other mammals. An attempt to bridge the gap was made in two articles by the late Helen B. Taussig — outstanding clinician, teacher and the author of *Congenital Malformations of the Heart* published in 1947. Dr Taussig launched a concept of evolutionary (as opposed to teratogenic), origin of isolated cardiac malformations. Her idea came up as a result of deductive reasoning based on published reports and on her own experimental work in mammals and birds.

In order to provide a better understanding of the malformations in mammals, I thus decided to produce a book that, hopefully, will prove to be useful. R.H. Anderson, friend and co-worker, encouraged me to proceed with the plans for the book. Linking his senior associate to the project was a prerequisite for quality and insight.

The first step in preparing this book was to familiarise myself with previously published work. It is clear from the list of references in Appendix 1 that there are a number of important contributions covering parts of the field. Surprisingly, no attempts have been made in recent years to present a more collected view on the subject. Ancient publications cannot be retrieved with computer-assisted literature search. I have had the privilege of full access to old veterinary books and scientific journals kept buried in the libraries of the Swedish University of Agricultural Sciences and of the National Veterinary Institute in Uppsala. The lists on published cases, old and new are certainly not complete, but the librarians did their best. Their help is gratefully acknowledged.

One requires more than just experience in human paediatric cardiology to be able to describe congenital defects in animals. It was clear that the dominant part of this work had to be based on post-mortem studies. However, it did feel natural, as a first step, to learn about living animals. My teachers of clinical veterinary cardiology — Clarence Kwart, Jens Häggström and Heikki Säteri, generously welcomed me as a regular guest at their outpatient clinic service. This admittance resulted in friendship, new knowledge and novel scientific studies. Echocardiography and Doppler examination are not very different from that in human paediatric cardiology but I would certainly not like to be without the experience of listening, for instance, to the slow Doppler signals from the equine aortic regurgitation. Estelle Ågren is to thank for opening the doors to the Department of Clinical Radiology at the Swedish University of Agricultural Sciences. She has selflessly provided radiological help with those tricky ruminant heart bones.

Personal experience in post-mortem studies of fresh normal and abnormal hearts was judged to be an essential part of the learning curve. Access to the post-mortem rooms in the Departments of Pathology at the National Veterinary Institute and at the Swedish University of Agricultural

Sciences was obtained through the Heads — Professors Claes Rehbinder and Lennart Jönsson, and by Torsten Mörner — Head of the Unit for Wild Animals at the National Veterinary Institute. The rounds with the daily education offered by the veterinary pathologists for more than a year have greatly contributed to the knowledge on cardiac and extra-cardiac diseases. The generous and patient attitude of all the staff, heads as well as technicians in the departments, is gratefully acknowledged. Special thanks are due to Carl Hård af Segerstad, Lennart Jönsson, Erika Karlstam, Claes Rehbinder and Erik Ågren. Clarence Kvarn kindly allowed us to reproduce many of the pictures in his personal collection.

About 60 congenital heart defects were identified, almost exclusively in domestic animals. This is a screening study on a selected autopsy material and it can hardly be used for calculations of incidence and prevalence figures. In our view, it can be looked upon as a guidance for studies on mammalian heart defects — where to look and what to find. We were impressed by the frequent occurrence of subvalvar aortic stenosis, not only as an isolated defect, but often in combination with other malformations of the heart. It so happened that many of the malformations found in this study are representative of the prevalence in different species, such as double outlet right ventricle in cattle, subaortic stenosis in pigs and tricuspid atresia in the horse. The fact that no severe defects were found in wild animals is hardly conclusive, although it can be tempting to speculate about effects of inbreeding and selectivity as explanations to differences between domestic and wild animals.

Congenital heart malformations in mammals is a vast topic. We have tried to generalise the text although it was often tempting to go into more details. A detailed account would have destroyed the original idea of presenting a reasonably short, illustrated text on our experiences as well as those of others. We hope that the reading will stimulate further studies — either on the clinical and pathological aspects of heart disease in various species or on animal models of human heart defects. Numerous questions in this relatively young field remain to be answered. Or, if we may borrow the words of Winston Churchill from 1942: “This is not the end, it is not even the beginning of the end but it is the end of the beginning”.

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Having majored in Zoology whilst at University, I was delighted when Magnus, a long-standing friend and collaborator, approached me with the idea of producing a book on congenital heart malformations in mammals. Through Magnus, I was able to re-aquaint myself with the animal kingdom and marvel, yet again, at the great diversity within this group. It is neither possible nor practical to include in this book all the subgroups. We have, therefore, focussed on the more common examples. The effort in this production is largely Magnus. His driving force behind this project, and the encouragement given by Professor R. H. Anderson, my mentor, were essential for me to complete this task. Magnus and I are both indebted to our many colleagues who brought cases to our attention and shared our enthusiasm. With my colleague, Leon Gerlis, I have also had many discussions on the variations of the aortic arch. My colleagues, Zarlisht Nejam, Satta Goba, Vi-Hue Tran, Karen McCarthy helped with printing the photographs while Peacelyn Jeyaratnam helped with the typing. They all provided assistance with a smile. The finishing touches of the manuscript could not have been achieved without their cheerful willingness.

Any deficiencies within this book, which undoubtedly there will be, are our full responsibility.

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