

## Book Review

MORPHOLOGY OF THE AUDITORY AND VESTIBULAR ORGANS IN MAMMALS, WITH EMPHASIS ON MARINE SPECIES. Galina N. Solntseva. Pencroft Publishers and Brill Academic Publishers, Sofia, Leiden, 2007. ISBN 9789004162020, 244 pp.

### Why Not to Ignore Russian Work

In 1968, Leigh Van Valen wrote a review of the English translation of Yablokov's book entitled *Phenetics*, which was originally written in Russian. Van Valen chose a provocative title for his review, and I use part of his title as mine. Van Valen's review reads more like an essay, with as its main point that publications outside of one's own scientific tradition should not be ignored. Specifically, Van Valen noted that the field of science is a continuum, and that different scientific traditions have divided that continuum in ways to make study manageable, but that the position of the lines between those subfields are not identical in different traditions. Going outside one's own tradition and adapting to the uncomfortable division of scientific subfields in a different culture may lead to refreshing insights and to noticing connections that were previously unobserved. In modern days, we might call this a quest for interdisciplinary approaches.

Van Valen poses that, at the time of his writing, there was a field of research on the phenotype in Russia, whereas in Western scientific traditions, the phenotype was mostly studied as a means to approach developmental biology or systematics. The Russian approach appealed to Van Valen as a way to enrich our own tradition, safeguarding us from scientific parochialism, seeing across barriers between subfields of science.

Galina Solntseva's career was running full throttle at the time of Van Valen's review, and her research fit squarely into the phenotype tradition which he identified: her career covers morphology of the ear, specifically that of marine mammals, and I was greatly looking forward to reading her review of the field of auditory and vestibular morphology in her book. Just like Van Valen's author, Solntseva has published a great deal in Russian, a language which I cannot read, and I had hoped that this review would be a summary of the field as well as an introduction to her own productive research career. The book is a success only in this second goal.

The book is divided in two parts: the first covering the anatomy and the second the embryology of the outer, middle, and inner ear across mammals. Each section starts with a general description of the anatomical segment, followed by a discussion of particular orders.

In the anatomy part, descriptions are cursory and hard to follow for those not already well familiar with ear anatomy. There are precious few diagrams, while the diagrams that are used only illustrate minor points. A large number of plates appear together at the back of the book; however, all are photographs of anatomical specimens and embryological sections that do not adequately illustrate the important points made in the text. The text is also oddly lopsided: in the anatomical section of the book, the outer ear section is longer than either the middle or inner ear sections, whereas research going on in the latter two areas must be in orders of magnitude larger than outer ear research. Occasionally, Solntseva strays into a discussion of function, such as on page 74, where she discusses the Coefficient of the Pressure Transmission, which combines a number of middle ear variables into one value and purportedly can be used to make inferences about animals hearing in aquatic environments. Although individual parts of this coefficient do capture certain functional traits, there is no explanation why these can all be combined into a single coefficient, and how it would capture the essence of middle ear sound transmission. This renders Solntseva's Coefficient, in my view, either irrelevant or just wrong.

The end of the anatomy section has two stand-alone chapters: one on adaptations and the function of the ear, and one on the innervation of the Organ of Corti. Here, Solntseva again leaves the phenotype and discusses function, mostly in aquatic mammals. On page 102, she states in a phrase, correctly, that Norris's hypothesis of sound transmission through the mandibular fat pad in cetaceans was experimentally confirmed. However, then she discusses the role that the external auditory meatus and the surface of the head plays in cetacean hearing, mostly based on her own work. This view clashes with Norris's hypothesis, although she does not point this out. I doubt that there is merit to this discussion, and it is certainly hard to discern owing to the poor translation.

It might appear that Solntseva boldly strays onto thin ice when she leaves her own field of phenetics; however, the problem is much broader than this. It appears that Solntseva's interest in non-Russian literature was diminishing when Van Valen wrote his review. The bibliography lists no references to non-Russian work post-1990, and just a handful appear from the decade before that. Solntseva appears to not be aware of the detailed morphometric and functional work by Sirpa Nummela on the middle ear in cetaceans, or that by Darlene Ketten and co-workers on the inner ear. It is clear that this book is not a review of the field of ear morphology.

The embryological section does present useful information, describing the ontogenetic development of the ear of *Erignatus*, *Pusa*, *Eumetopias*, *Odobenus*, *Stenella*, *Delphinapterus*, *Balaenoptera*, as well as some land mammals. Descriptions are not excessive, there are no diagrams or three-dimensional reconstructions, and the embryological material is limited, but a large number of histological micrographs show ear development in some detail to those well-versed in embryology. Much of this material has been published only as summary descriptions in Russian by Solntseva, so it is useful to see all of it brought together.

This book is not a review of the field, and I can recommend it only to those familiar with the anatomical literature on the sense organs in the ear. It is useful for those specialists on hearing morphology in marine mammals and those who are not familiar with Solntseva's many published papers (citations of her own work in the bibliography run an incredible five pages). Van Valen would probably have been pleased to see the tradition of phenetic research in action, and interested that his views about the divisions of science in Russia have been confirmed. He would certainly not have been pleased about the extreme level of parochialism that the book attests to.

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#### Literature Cited

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