

**PROCEEDINGS OF THE THIRD
USA-USSR SYMPOSIUM ON THE
EFFECTS OF POLLUTANTS UPON
AQUATIC ECOSYSTEMS, JULY 2-
6, 1979**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649098187

Proceedings of the third USA-USSR symposium on the effects of pollutants upon aquatic ecosystems, July 2-6, 1979 by Wayland R. Swain & Virginia R. Shannon

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

WAYLAND R. SWAIN & VIRGINIA R. SHANNON

**PROCEEDINGS OF THE THIRD
USA-USSR SYMPOSIUM ON THE
EFFECTS OF POLLUTANTS UPON
AQUATIC
ECOSYSTEMS, JULY 2-6, 1979**

EPA-600/9-80-034
July 1980

PROCEEDINGS OF THE THIRD USA-USSR SYMPOSIUM
ON THE EFFECTS OF POLLUTANTS UPON AQUATIC ECOSYSTEMS

Theoretical Aspects of Aquatic Toxicology

July 2-6, 1979

Borok, Jaroslavl Oblast
USSR



Edited by

Wayland R. Swain
and
Virginia R. Shannon

ENVIRONMENTAL RESEARCH LABORATORY-DULUTH
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
DULUTH, MINNESOTA 55804

DISCLAIMER

This report has been reviewed by the Environmental Research Laboratory-Duluth, U.S. Environmental Protection Agency, and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

FOREWORD

These Proceedings result from the third symposium held by Project 02.02-13 under the aegis of the US-USSR Joint Agreement in the Field of Environmental Protection, established in May, 1972.

Both broad review and narrowly specific papers were presented by participants from both countries in an effort to continue the joint procedural, technological and methodological exchange and familiarization begun at the two preceding symposia in 1975 and 1976. Learning does not occur de novo and subsequent understanding and application must be based on a foundation of fact. The atmosphere of mutual interest, candor and respect which surrounded this symposium enabled another series of steps in the learning process. Perhaps the philosophy underlying this symposium, and the project itself is best expressed by an old saying, which transliterated from the Russian approximates: Vyek zhee-vee, Vyek oo-chee, Live a lifetime, learn a lifetime.

Norbert Jaworski, Ph.D
Director
Environmental Research Laboratory-
Duluth

PREFACE

This volume contains the papers presented at the Third US-USSR Symposium on the Effects of Pollutants on Aquatic Ecosystems entitled, "Theoretical Aspects of Aquatic Toxicology". All of the papers were presented in English or Russian with simultaneous translations into the corresponding language at Borok, Jaroslval Oblast, USSR during July 2-6, 1979, at the Institute for the Biology of Inland Waters of the USSR Academy of Sciences.

Professor N.V. Butorin, Director of the Institute and Project Leader for the Soviet side, served as official host for the American delegation and has assumed the responsibility for the publication of these proceedings in the Russian language. This joint bilingual publication represents a reaffirmation of the continuing commitment pledged by both countries to cooperative environmental activities.

INTRODUCTION

The Joint US-USSR Agreement on Cooperation in the Field of Environmental Protection was established in May of 1972. These proceedings result from one of the projects, Project 02.02-13, Effects of Pollutants Upon Aquatic Ecosystems and Permissible Levels of Pollution.

As knowledge related to fate and transport of pollutants has grown, it has become increasingly apparent that local and even national approaches to solving pollution problems are insufficient. Not only are the problems themselves frequently international, but an understanding of alternate methodological approaches to the problem can avoid needless duplication of efforts. This expansion of interest from local and national represents a logical and natural maturation from the provincial to a global concern for the environment.

In general, mankind is faced with very similar environmental problems regardless of the national or political boundaries which we have erected. While the problems may vary slightly in type or degree, the fundamental and underlying factors are remarkably similar. It is not surprising, therefore, that the interests and concerns of environmental scientists the world over are also quite similar. In this larger sense, we are our brother's brother, and have the ability to understand our fellowman and his dilemma, if we but take the trouble to do so. It is this singular idea of concerned scientists exchanging views with colleagues that provides the basic strength for this project. While our methods may vary, our goals are identical, and therein lies the value of such a cooperative effort.

Wayland R. Swain, Ph.D., and
Richard A. Schoettger, Ph.D.
Co-Project Leaders, U.S. Side

CONTENTS

Foreword	iii
Preface	iv
Introduction	v
Figures	ix
Tables	xiv
Acknowledgment	xvii
1. A Research Strategy for Anticipating Contaminant Threats to Aquatic Resources Richard A. Schoettger and J. Larry Ludke	1
2. Principles of Estimation of Normal and Pathologic States of Reservoirs with Chemical Pollution N.S. Stroganov	18
3. Theoretical Aspects of the "Normalcy and Pathology" Problem in Aquatic Ecotoxicology L.P. Braginsky	34
4. Trends in Aquatic Toxicology in the United States: A Perspective Foster L. Mayer, Jr., Paul M. Mehrle, Jr. and Richard A. Schoettger	44
5. Comparison of Principles of Development and Use of Water Quality Standards in the USSR and USA L.A. Lesnikov	60
6. Chlorinated Hydrocarbons as a Limiting Factor in the Reproduction of Lake Trout in Lake Michigan Wayne A. Willford	75
7. Organophosphorus Pesticides and Their Hazards to Aquatic Animals V.I. Kozlovskaya and B.A. Flerov	84
8. Monitoring Contaminant Residues in Freshwater Fishes in the United States: The National Pesticide Monitoring Program J. Larry Ludke and C.J. Schmitt	97