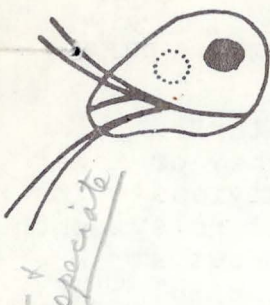


# Fish Health Section Newsletter

**A  
S  
F**

*Warren, Chairman  
FHS Bd of Cert.*



Volume 6

January-March 1978

Number 1

## B.K.D. VERTICAL TRANSMISSION

Although there is an abundance of circumstantial evidence for vertical transmission of corynebacterial kidney disease (KD), unequivocal data are lacking. The efficacy of iodophor treatment of eggs for prevention of vertical transmission has also not been established. To provide answers that can be applied in practical situations an experiment was set up at the National Fisheries Research Center, Seattle, and the National Fish Health Research Laboratory, Leetown. The reason for conducting the experiment at two locations was to test the reported effect that incidence and severity of KD are greater in areas of soft water ( 100 ppm) such as found in Seattle as opposed to hard water areas such as Leetown.

Eggs were obtained from spring chinook salmon, State of Washington, that showed clinical KD and from rainbow trout brood stock, State of Missouri, that had a past history of KD, but no evidence of the disease at the time of spawning. Eggs from each group were divided, one portion was disinfected with organic iodine at 100 ppm for 15 min. and the second portion was not treated. Eggs were hatched and all mortalities from each group examined for the causal bacterium by indirect fluorescent antibody technique, or immunodiffusion.

Vertical transmission of KD occurred in all groups of fishes at both laboratories and there was no apparent effect of water chemistry on the incidence of severity.

	Seattle		Leetown	
	Iodophor disinfection	No disinfection	Iodophor disinfection	No disinfection
Chinook salmon	KD bacteria present, but no overt disease	Clinical KD 2 to 4 mo. after hatching	Clinical KD 2 to 4 mo. after hatching	Clinical KD 2 to 4 mo. after hatching
Rainbow	-----No clinical KD seen, but KD cells seen on FAT antigen detected by immunodiffusion-----			

As shown in the table, when the eggs from diseased chinook salmon parents were not disinfected, kidney disease appeared in clinical form at both laboratories within 2 to 4 months. However, disinfection of eggs from the same source reduced the severity but did not eliminate transmission. Salmon hatched from disinfected eggs at Leetown still developed clinical KD, while those from the disinfected group at Seattle showed presence of KD but no frank disease.

*12 Saprolignia  
13 Krain book  
speciate  
1978  
6(1)  
11, 12, 13  
H-16, 8,  
11, 12, 13  
P6-Tabor  
H. Dug  
H. Dug*

Results with rainbow trout were uniform at both laboratories. Low numbers ( 1 cell/field) of KD bacteria could be seen in kidney or lower gut. Soluble KD antigen could also be demonstrated from individuals in groups of trout from disinfected and nondisinfected eggs, but no evidence of disease was seen during the 11 mo. observation period. Trout at Leetown are still being observed for evidence of clinical disease.

Our data show that KD is egg transmitted and while disinfection with organic iodine will reduce severity, it does not eliminate transmission. Brood stock with a past history of KD, but no clinical sign of disease at spawning, are capable of KD transmission. Offspring from such brood stock were found to harbor low numbers of KD bacteria and the threat of KD among these fish is present as well as the danger of their spreading KD to other stocks of fish.

#### Investigators:

G. L. Bullock, H. M. Stuckey, National Fish Health Research Laboratory, National Fisheries Center, Leetown

D. Mulcahy, National Fisheries Research Center, Seattle

#### IDENTIFICATION OF ENTERIC REDMOUTH BACTERIUM

Recent work conducted at the National Fisheries Center in Leetown, WV and at the Fish Disease Control Center in Ft. Morgan, CO indicates that only antisera prepared from whole-cell antigen should be used for identification of Yersinia ruckerii. Use of antisera prepared from O-antigen can give false results when used for slide agglutination and possibly with fluorescent antibody. (For additional information contact Graham L. Bullock, National Fisheries Center, Box 41, Kearneysville, WV 25430, or Paul W. Janeke, Fish Disease Control Center, P. O. Box 917, Ft. Morgan, CO 80701.

#### EFFECTS OF NO CHEMOTHERAPEUTICS

As all of you know the problem of using chemicals or antibiotics on food fishes is a continuing dilemma and one with which most of us are concerned. No one actually knows what will happen if the chemicals now in use are removed from the fish husbandryman's "medicine chest" (a term coined by a noted fish parasitologist). However, the potentials for severe production losses are tremendous. Mr. Porter Briggs, Executive Secretary, Catfish Farmers of America, recently compiled data from various aquaculture interests, which gives some idea of the potential losses. He kindly consented to publishing these data in the Fish Health Newsletter. These data were sent to the Commissioner, U.S. Food and Drug Administration along with a letter from Mr. Briggs emphasizing the concern of the Catfish Farmers of America on the possibility of losing the use of some very helpful therapeutics. He also encouraged the rapid adoption of guidelines for registration of "minor use" drugs for aquaculture. I believe that you will find these data not only interesting, but also astonishing and alarming. We appreciate Mr. Briggs sharing this information with us.

John A. Plumb

Estimated losses of fish to disease if treatment is withheld.

SPECIES	ANNUAL PRODUCTION	\$ VALUE	% LOST IF NOT TREATED	POTENTIAL \$ LOSS IF NOT TREATED
Channel catfish (food fish)	80 million lbs (50,000 acres @ 1,600 lbs/A)	\$44 million (55¢/lb)*	20	\$8.8 million
Channel catfish (fingerlings)	175 million (5,000 acres @ 35,000/A)	\$15,750,000 (@ 9¢ each)*	65	\$10.2 million
Bait minnows	15 million lbs. (40,000 acres @ 375 lbs/A)	\$23 million (@ \$1.54/lb)*	50	\$11.5 million
Rainbow trout	40 million lbs. (2,000 acres of ponds + 16 million ft <sup>3</sup> of raceways)	\$38 million (@ 95¢/lb)	70	\$27 million
Other species	32 million lbs (20,000 acres @ 1,600 lbs/A)	\$80 million (at \$2.50/lb)	65	\$52 million
Totals	Not applicable	\$200.75 million	Not applicable	\$109.5 million

\*Average price to farmer for live fish, multiply by minimum factor of 4 to obtain effect on overall economy due to retail sales and related processing, feed, equipment, etc. sales.

FISH HEALTH SECTION--FINANCIAL REPORT FOR 1977

In 1977 separate savings accounts were established for Fish Health Section general activities, certification of Fish Health Inspectors and Glossary of Fish Health Terms.

General Account

Income

1976 Balance . . . . .	\$ 322.07
Membership Dues . . . . .	1,177.75
FHS Procedures Book . . . . .	227.94
Savings Interest . . . . .	<u>47.37</u>
	1,775.13

Expenditures

Newsletters - Printing and Postage	
Vol. 4, No. 4 . . . . .	169.91
Vol. 5, No. 1-4 . . . . .	218.85
Membership and Balloting . . . . .	223.96
Board of Certification . . . . .	114.49
Past President Certificates . . . . .	52.00
Stationary Supplies . . . . .	<u>103.26</u>
1977 Balance . . . . .	882.47

Certification of F.H. Inspectors Account

Income - Certification fee \$50.00 each . . . . .	150.00
Savings Interest . . . . .	<u>0.49</u>
Balance . . . . .	150.49

Glossary Account

Support by the U.S. Fish and Wildlife Service for	
Glossary Preparation . . . . .	2,000.00
Savings Interest . . . . .	3.26
Expenditures - Printing and Postage . . . . .	<u>1,855.74</u>
Balance . . . . .	147.52

For further information, contact Richard A. Holt, Finance Committee Chairman, Dept. of Microbiology, Oregon State University, Corvallis, Oregon 97331.

## NEW MEXICO EVALUATES ERM VACCINE

The New Mexico Department of Game and Fish has begun evaluation of a commercially-available enteric redmouth vaccine. In April and June of 1977, 150,000 rainbow trout were vaccinated at 1.3 inches (1000/lb.) and 1.7 inches (500/lb.) respectively. A control group of 150,000 trout from the same egg lot were not vaccinated and served as controls. Shortly after the second vaccination, 75,000 trout from each group were transferred to a rearing station where Yersinia ruckerii and Aeromonas salmonicida are enzootic.

Both vaccinates and non-vaccinates suffered epizootics during July, September, October and November. Organisms implicated in the vaccinated group were A. salmonicida (July and Nov.), Y. ruckerii (Sept.), A. salmonicida and Y. ruckerii (Oct.); for un-vaccinated trout A. salmonicida and Y. ruckerii (July and Nov.), Y. ruckerii (Sept. and Oct.)

Performance of vaccinated trout was statistically better in total percent mortality, percent mortality per day, and food conversion. Vaccinated trout responded to chemotherapy more readily than non-vaccinated fish. This evaluation is continuing and additional tests will be started in 1978. (For further information, contact Thomas Moody, Dept. of Game and Fish, Villagra Bldg., Santa Fe, NM 87503).

## "DILUTION THEORY" IS WORKING?

The Willow Beach National Fish Hatchery is located on the Arizona bank of the lower Colorado River, 10 miles below Hoover Dam. All water, used to produce 140,000-200,000 pounds of rainbow trout annually, is pumped from the Colorado River (Lake Mohave) and is subsequently discharged into the river.

Infectious pancreatic necrosis virus was first isolated from trout at the hatchery in 1970. IPN epizootics became relatively common. At the time, it was thought there was no practical means of eliminating the virus from the hatchery as most of the fish produced were stocked in the water supply. Virus shed from fish in the hatchery was also being discharged into the water supply in the effluent.

In 1974, results of a study by the state of Utah at Scofield Reservoir indicated there was the possibility of eradicating IPNV from the Willow Beach NFH. Trout infected with IPN virus were stocked in Scofield Reservoir in 1968-69. Only IPNV-free trout were stocked after that time. Beginning in 1970, sport-caught trout from the reservoir were tested for IPNV. The virus was isolated during the 1970 and 1971 sampling periods. The virus has not been isolated since. It appeared that the relative incidence of IPNV-infected trout had been diluted to an undetectable level by the stocking of IPNV-free fish as well as removal of infected fish by fishermen.

Late in 1974, and in light of the Utah project, a study was begun on Lake Mohave. Viral assays were conducted on trout from the lake as well as sentinel trout fry confined in the influent waters of the Willow Beach NFH. IPNV was isolated from 25 percent of the lake fish tested and was never found in the sentinel trout. Of the IPNV positive lake fish, only one exceeded 2.5 years of age. (For more details, see: Rosenlund, B.D., 1977. Infectious Pancreatic Necrosis Virus at the Willow Beach NFH, and in Rainbow Trout Stocked into Adjacent Lake Mohave. Fish Health News, 6(1):10-11.)

The Willow Beach NFH was completely disinfected in March 1976. Rainbow trout eggs from IPNV-free sources were received shortly thereafter and the normal production cycle was resumed.

Beginning in July 1976, all lots of trout at the hatchery have been tested for IPNV every three months. As of January 1978, the virus has not been isolated from any of the 2100 fish tested.

Testing of free-ranging trout in Lake Mohave was begun again in January 1977. To date, all 266 fish tested have been negative for IPNV. (For more information, contact Ron Major, Alchesay NFH, Whiteriver, AZ 85941, or Paul Janeke, Fish Disease Control Center, POB 917, Ft. Morgan, CO 80701.)

### TWO URGES TO KILL

MAILING SPECIMENS -- it may seem silly to write about such a mundane subject, but in the past few years I have received several shipments containing broken slides or bottles. Most of the broken slides arrived in those handy cardboard mailers which had been placed in envelopes, some padded. It is best to place such handy mailers in a well packed mailing tube or box. Bottles, of course, should be even more thoroughly padded. For further information, contact Dr. Glenn L. Hoffman, U.S. Fish and Wildlife Service, Fish Farming Experimental Station, P.O. Box 860, Stuttgart, AR 72160.

WHAT IS TAXONOMY? -- Some confusion regarding the proper use of this word seems apparent. TAXONOMY is the classification of things, placing organisms in order according to their relationships. DIAGNOSIS is the determination of the nature of a disease, identifying the disease by its symptoms, signs, history, and cause. IDENTIFICATION is the recognition of a specific causative agent or organism. DESCRIPTION is the study of the peculiarities of appearance and properties of an organism. SPECIATION (SPECIATE) refers to the evolutionary process by which species are produced, not the identification of a species.

A virologist describes a virus (size, shape, chemical properties, serology, infectivity). He may identify it as the cause of a disease. This is not taxonomy.

A bacteriologist describes a bacterium (size, shape, staining, cultural and physiological characteristics, serology, infectivity). He also may identify it as the cause of a disease. This also is not taxonomy.

A parasitologist likewise describes a parasite (size, shape, internal anatomy, staining properties, infectivity). He may identify it as the cause of a disease, and this is not taxonomy.

However, when any of these scientists attempts to differentiate the particular organism from all similar organisms, gives it a name, and attempts to place it in relationship to similar organisms, this is taxonomy. And this may be an integral part in the accurate diagnosis of a disease. For further information contact Dr. G. L. Hoffman, U.S. Fish and Wildlife Service, Fish Farming Experimental Station, P. O. Box 860, Stuttgart, AR 72160.

## D.V.M.'S-FISHERIES BIOLOGISTS--TWO COMMENTARIES

I was taught early in veterinary school that "competing" is best left to the used car salesman and other commercial ventures. If we in the fish health profession hope to advance the science of prevention and control of disease we will do so working together and judge our colleagues on merit and ability as well as academic credentials. I would doubt if any of the hundreds of scientist working with fish health feel threatened by the four or five DVM's engaged in the practice of fish medicine. I would also imagine that most young veterinarians after seven to eight years of college and internship would not be willing to become involved in an area where the monetary compensation is so much less than that of private practice of veterinary medicine. Should I feel threatened by MD s I know who are in the fish health field? If I did it would not speak very highly of my own confidence in aquacultural medicine.

Lee W. Harrell, D.V.M., M.S. fisheries biology

In the last fish health newsletter, there was a review of my article AQUATIC ANIMAL MEDICINE...A NEW SPECIALTY FOR VETERINARIANS. The editor's comments concerning the "competitiveness" between veterinarians and fishery scientists prompted me to express my viewpoint on this real or imagined conflict between the two groups.

Dr. Sullivan was concerned that D.V.M.'s in great numbers may begin competing with fishery biologists. I don't really think this is going to be a problem. A veterinarian without thorough training in aquaculture will never be qualified to replace the hatchery biologist; nor would a veterinarian likely be content with the salary from the state fish and game departments. A recent article in Fisheries\* (vol 2 no. 5) listed the average salary for state fishery biologists to be \$13,982. This is far below the average annual salary for veterinarians.

I think the fish & game departments will still seek the experienced aquaculturist; the universities will still prefer the Ph.D.'s and the veterinarians will still seek any area that looks profitable. If it becomes profitable to examine and treat exotic tropical fishes in the animal hospital then you can be sure that some veterinarians will show an interest in fish medicine.

It took awhile for veterinarians to gain the respect of pet bird owners, but now veterinarians across the country practice good avian medicine. I predict that within the next decade, aquarists will begin to rely more and more on the opinions of private practitioners. After all, what good are isolated fish health specialists to the average aquarist? Someone with a sick pet needs a specialist available at the local level, not a thousand miles away at some government or academic institution. Of course, most veterinarians are not ready to accept the challenge of aquatic animal medicine, but recently several veterinary schools have made strides to change all of that. Fish medicine is now being offered at some veterinary schools and someday I think most veterinary colleges will offer at least some training in both commercial and exotic fish medicine.

However, I really don't think there will be any insurrection whereby veterinarians stomp across the countryside trying to collect your formalin and malachite green. We still have much to learn in the area of fish disease diagnostics, prevention and therapeutics-- who knows, perhaps some of these newcomers can help us out.

Mark P. Dulin, D.V.M.

\*Sullivan, Carl R. Salaries of Fishery Biologists (June 1977) in the United States and Canada. FISHERIES Vol. 2, No. 5.

#### WHERE TO GO FOR HELP

DIAGNOSTIC SERVICES AVAILABLE--A national list has been published in the November 1977 (Volume 4, No. 1) issue of COMMERCIAL FISH FARMERS, pages 33-37. Unintentionally omitted was Fish Diagnostic Laboratory, Department of Avian and Aquatic Animal Medicine, Cornell University, Ithaca, NY 14853; (607) 256-5440. If anyone else has been omitted it was unintentional. Those not in the 1977 list wishing to be in the 1978 list should contact Dr. Glenn L. Hoffman or Drew Mitchell, U.S. Fish and Wildlife Service, Fish Farming Experimental Station, P. O. Box 860, Stuttgart, Arkansas 72160.

#### FHS CERTIFICATION OF FISH HEALTH INSPECTORS UNDERWAY

The FHS Board of Certification reports that as of February 15, 1978 a total of 13 applications have been received from individuals seeking certification as Fish Health Inspectors. Of these 13, Board action has been completed for six applicants. Three applicants received Board approval. Board action is nearly completed on four other applications and three others are on file awaiting receipt of the required letters of reference.

Certification as a Fish Health Inspector establishes the applicant's credentials within his profession. In turn, certification enables conservation agencies to determine who is qualified to inspect fish populations. This is especially important when long distance arrangements are involved with fish or egg shipments. At this time more than half of the states in the U.S. and all of the provinces of Canada require fish to be inspected and found to be free of certain diseases before an importation permit will be issued to a hatchery scheduled to receive fish or eggs. The FHS peer review system for identifying competent fish health inspectors is felt to be an improvement over lists of individuals developed administratively by agencies in the past.

Fish health specialists routinely participating in disease inspection work should actively pursue certification by the FHS to enhance both the development of the profession and the development of sound fish health programs. Application forms are available from Dr. Richard Heckmann, Department of Zoology, Brigham Young University, Provo, UT 84601. The completed form and all supplementary materials should be sent to James W. Warren, Chairman, FHS Board of Certification, P. O. Box 252, Geneva, WI 54632. Applicants should simultaneously solicit three letters of recommendation which should be addressed directly to the Chairman of the Board of Certification.

## CALLS FOR PAPERS, MEETINGS

### THIRD ANNUAL FISH HEALTH WORKSHOP

The Third Annual Eastern Fish Health Workshop will be hosted by the Southeastern Cooperative Fish Disease Project, Department of Fisheries and Allied Aquacultures, Auburn University, Auburn, Alabama on May 23 and 24, 1978. Arrangements have been made to hold the workshop at the Student Union on the Auburn Campus.

The Third Workshop will be very similar to the Second with a moderately structured program to accommodate individual presentations and with ample time for discussion by the group. We hope to have sufficient input from freshwater and marine fish and shellfish disease specialists which should appeal to a variety of interests.

Registration will begin at 7:30 a.m. on Tuesday, May 23 and continue until noon at your convenience. The tentative program is divided into six two-hour modules as follows:

- I. Introduction, welcoming address and preventive medicine in Aquaculture.
- II. Viral diseases of fish and shellfish.
- III. Bacterial diseases of fish and shellfish.
- IV. Parasitic diseases of fish and shellfish.
- V. Clinical detection of certain fish pathogens.
- VI. Histopathology of fish and shellfish.

Abstracts of the presentations will be provided to the registrants. An outdoor fish fry is planned for the evening of May 23 at our experimental pond area. Transportation will be provided for those needing it. A \$5.00 registration fee will be charged for the workshop to cover expenses of coffee and donuts at the workshop and the fish fry.

Southeastern Commuter Airlines makes four flights from Auburn to Atlanta and return daily. Transportation for the Auburn-Opelika Municipal Airport can be provided. Major Airline connections may be made into Columbus, Georgia (40 miles from Auburn) and Montgomery, Alabama (60 miles from Auburn), however, there is no commercial carrier from either of these two airports to Auburn. If you fly into these airports you must arrange for transportation to Auburn.

If there are any questions or problems that we may help you with, please call on us between 7:45 a.m. and 4:45 p.m. CDT at 205-826-4786. We look forward to having you on the Auburn Campus.

W. A. (Bill) Rogers  
John A. Plumb

See Bill or John for motels as well. (Editor)

### NINTH ANNUAL I.A.A.A.M. CONFERENCE AND WORKSHOP

The Ninth Annual Conference and Workshop for the International Association of Aquatic Animal Medicine will be held April 23-27 at the San Diego Hilton Hotel, 1775 East Mission Bay Drive, San Diego, CA 92109. The program will cover husbandry, disease, pharmacology, medical physiology, nutrition, and reproduction of aquatic mammals and fish. For further information please contact Dr. John B. Gratzek, Department of Medical Microbiology, College of Veterinary Medicine, The University of Georgia, Athens, Georgia 30602.

## CALL FOR PAPERS AT KANSAS CITY MEETING

The 3rd Biennial Fish Health Section Workshop will be held jointly with the 9th Annual Midwest Fish Disease Workshop at the Plaza III Hotel in Kansas City, MO August 15-18, 1978. Papers, panel discussions and static displays dealing with technical topics will be featured on the FHS portion of the program while practical disease problems and their control will be discussed during the Midwest segment.

The meeting will be arranged into 1½ hour modules. Speakers presenting technical papers will be asked to prepare "mini-papers" up to 1,000 words in length by July 1st for inclusion in the published abstracts handed out at the meeting. Those presenting practical reports will be required to prepare 100-200 word abstracts.

Anyone interested in presenting a report at the Kansas City meeting should contact one of the following two individuals:

Dr. Guy Tebbit  
Wildlife Vaccines, Inc.  
11475 West 48th Ave.  
Wheat Ridge, CO 80033  
(303) 422-8323

or

Dr. John H. Schachte  
Fish Pathology Unit  
8314 Fish Hatchery Rd.  
Rome, NY 13440  
(315) 337-0910

Following placement on program, mini-papers and abstracts should be sent as soon as possible to Dr. John L. Fryer, Department of Microbiology, Nash Hall, Oregon State University, Corvallis, OR 97331. Dr. Fryer is in charge of preparing and publishing a booklet including the abstracts, a copy of the program, and other meeting highlights.

April 30th is the last day that unsolicited papers will be received for consideration by the program committee. Speakers selected for the program will be notified by May 15th. Abstracts submitted under the guidelines listed above should be in final form ready for duplication.

For information on the hotel and meeting room facilities contact Mr. Chuck Hicks, Missouri Department of Conservation, P. O. Box 180, Jefferson City, MO 65101, (314) 751-4115.

## OSU--SEA GRANT

Oregon State University, through their Sea Grant Program, held a conference on the disease inspection and certification of fish and eggs January 13 and 14 in Portland, Oregon. Overviews of certification and importation regulations for European and North American countries were presented, including a list of disease agents mentioned in state and regional regulations in the United States. Earl Pulford reviewed the proposed fish disease regulations for Oregon which clearly outlined the responsibilities of fish culture facilities towards diseases and levels of importance to particular diseases. Diagnostic procedures for diseases in general and in particular were reviewed. Northwestern commercial fish growers were well represented and the input they gave to the discussions following the formal presentations provided a different and valuable perspective on fish diseases.

For more information on the conference contact Dr. John L. Fryer, Dept. of Microbiology, Nash Hall, Oregon State University, Corvallis, OR 97331. For a copy of Oregon's fish disease guidelines contact Earl Pulford, Oregon Dept. of Fish and Wildlife, 17330 SE Evelyn St., Clackamas, OR 97015.

## NEW PUBLICATIONS

BIOLOGY OF THE MICROSPORIDIA by Jiri Vavra and Victor Sprague (1976) is available from Plenum Press, 227 West 17th St., New York, NY 10011 for \$37.50. This 371 page book is the first volume of the series, Comparative Pathobiology. The following summary is from Plenum Press:

Based on a critical evaluation of all currently available data, this work presents a summary of present knowledge on the microsporidia, a large group of pathogenic protozoa. The first complete coverage of these organisms to be offered in more than fifty years, Biology of the Microsporidia stresses structure, development, and host-parasite relationships at the cellular and the organismal level.

SYSTEMATICS OF THE MICROSPORIDIA by Victor Sprague and Jiri Vavra (1977) is available from Plenum Press, 227 West 17th St., New York, NY 10011 for \$39.00. This 446 page book is the second volume of the series, Comparative Pathobiology. The following summary is from Plenum Press:

Complementing Volume 1 of this series, which dealt with the biology of the microsporidia, this second volume is a comprehensive review of the current state of knowledge of microsporidian taxonomy. It constitutes the most complete annotated list of microsporidian species currently available. This unparalleled volume outlines microsporidian classification and phylogeny and provides a zoological distribution for each species.

NEW BOOK ON FISH DISEASES--A recent translation of a Czechoslovakian book titled Methods for the Diagnosis of Fish Diseases is now available. The translation is edited by Dr. Glenn Hoffman. The book provides an introduction to the individual cultured species in Czechoslovakia which is intended to acquaint the inexperienced student with terminology, definitions and fish transport requirements. There are instructions for the diagnosis and investigation of infectious diseases of fish with the emphasis on European problems. However, much of the information is applicable to North America. Viral infections are covered lightly, but various chapters stress fungal, bacterial and parasitic diseases with keys and other information for etiological and taxonomic identification. Methods of dissection and necropsy are in good detail. Some strong points are chapters on determining health conditions of fish, determination of important properties of water, key methods for the diagnosis of fish diseases, and haematological methods. Unfortunately, modern methods of bacterial identification are not included. This book should be very useful for the beginning fish disease student as well as the experienced biologist. It is available from the U.S. Dept. of Commerce, National Technical Information Service, Springfield, VA 22161.

John A. Plumb

DO AQUATIC INSECTS HAVE PARASITIC NEMATODES? When searching for intermediate hosts of fish nematodes one might find nematodes in aquatic insects; these could be natural parasites of the insects belonging to the family Mermithidae. A recent translation has become available--Rubzon, I.A., 1972, Aquatic Mermithidae of the Fauna of the USSR, Vol. 1, "Nauka" Publishers, Leningrad, 280 pp.--Translation Pub. for Agric. Res. Serv., U.S. Dept. Agric. and Nat. Sci. Found., Washington, D.C., avail. as TT74-52046 from Na. Tech. Info. Serv., Springfield, VA 22151.

"Mermithids (family Mermithidae) is a family of parasitic nematodes comprising many species, most of which have not been studied adequately. These nematodes parasitize nearly every order of class Insecta, aquatic and terrestrial alike. The present work is the first taxonomic study of aquatic mermithids, which differ considerably (both biologically and morphologically) from terrestrial mermithids, and comprise more than two-thirds of all the known species of the family Mermithidae.

The present study is divided into two volumes. Volume I consists of a morphological description, information on the methods of investigation, identification keys, and a diagnostic description of the species for 12 genera. Volume II gives identification keys and a diagnostic description of the species for diagnostic description of the species for another nine genera, in addition to information on the biology, ecology, and geographic distribution of mermithids. It also emphasizes the important role played by these beneficial parasites in the control of blood-sucking Diptera." (Quote from book jacket.)

For further information contact Dr. Glenn L. Hoffman, U.S. Fish and Wildlife Service, Fish Farming Experimental Station, P. O. Box 860, Stuttgart, AR 72160.

SAPROLEGNIA CONNOISSEURS--Roland L. Seymour. 1970. The Genus Saprolegnia. Verlag Von J. Cramer, 3301 Lehre, Kampstim, W. Germany, DM-40 (Jan. 1978, about \$19), 280 pp., illustrated. Included are sections on morphology and life cycles of Saprolegnia, a key to the species, and descriptions of all known species. The bibliography appears to be complete. This book should be helpful to fish disease workers because some species of Saprolegnia are more infectious and pathogenic than others. Also, there are indications that some species are more resistant to certain chemotherapeutants than others, therefore, it is important that we try to make species determinations. For further information contact Dr. Glenn L. Hoffman, U.S. Fish and Wildlife Service, Fish Farming Experimental Station, P. O. Box 860, Stuttgart, AR 72160.

JOURNAL OF FISH DISEASES--Volume 1, Number 1 has gone to press. Papers accepted for early publication include work on agglutinins, algal infections, Balantidium ctenopharyngodonis, Dicauda (new genus of Myxosporida), Epitheliocystis, Exophiala salmonis, Furanace, furunculosis, Glugea anomala, Ichthyophonous-like, oncovirus, Myxobolus insidiosus, nephrocalcinosis, papilloma, proliferative kidney disease of trout, rickettsia, Sacculina granifera, Saprolegnia, Stephanochasmus buccatus, streptococcal infection, tumors, Vibrio, and includes mollusc as well as teleost diseases. For further information contact the editor, Dr. Ron Roberts, Unit of Aquatic Pathobiology, University of Stirling, KF9 4LA, Scotland or a member of the editorial board. Published quarterly at £18.00 (U.K.), £22.00 (overseas), \$50.00 (U.S.A. and Canada) per annum.

Glenn L. Hoffman

PARASITIC PROTOZOA, a new book in 4 volumes, edited by Dr. J. Keier of Ohio State University has been published. This is the first parasitic protozoa text that includes fish parasites. The following chapters are included:

Dr. C.D. Becker--Flagellate Parasites of Fish, Vol. 1, pp. 357-416.

Dr. G.L. Hoffman--Ciliate and Suctorian Parasites of Fish, Vol. 2 (in press)

Dr. L. G. Mitchell--Myxosporida, Vol. 4, pp. 115-154.

Dr. Elizabeth Canning--Microsporida (includes fish), Vol. 4, pp. 155-196.

The other chapters include Taxonomy, Kinetoplastids, Gregarines, Haemogregarines, Coccidia, Plasmodia, Babesia, Theileria, Bartonellaceae, Anaplasmataceae, Ehrlichia, and Pneumocystis.

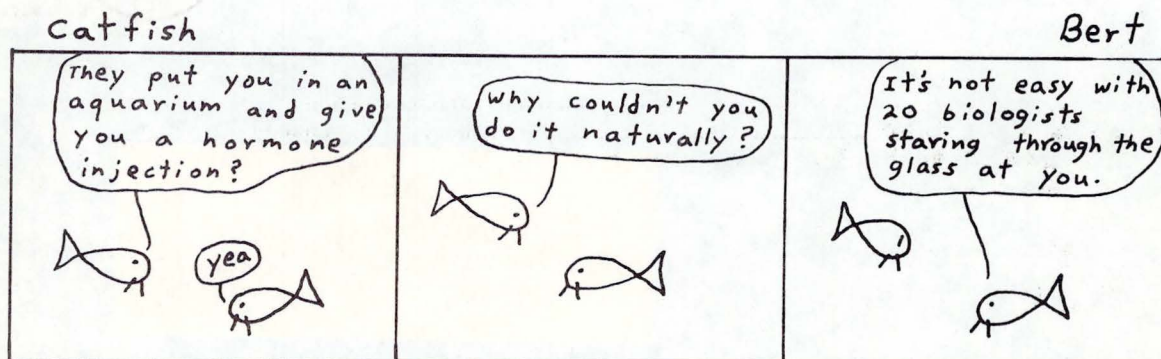
These volumes were designed to aid in teaching medical, veterinary, and fisheries parasitic protozoology.

For further information contact Academic Press, 111 Fifth Avenue, New York, NY 10003.

Glenn L. Hoffman

## POSITION ANNOUNCEMENT

ASSISTANT PROFESSOR POSITION IN FISH PATHOLOGY AND CULTURE--The Department of Fisheries at Humboldt State University announces an assistant professor position in fish pathology and culture. Completion or near completion of a doctorate degree in fisheries or in a closely related field is required. Duties would include teaching graduate and undergraduate courses in fish pathology, fish physiology, and fish culture (culture emphasis on warm-water species); to guide undergraduate and graduate students in research activities. Support facilities include a recirculating water salmon and trout hatchery, a well-equipped pathology laboratory, wastewater fish culture ponds, and a marine fisheries station. Applicants should submit a letter of application, resume, transcripts of academic work and three letters of recommendation by May 15, 1978 to: Dr. Donald W. Hedrick, Dean, School of Natural Resources, Humboldt State University, Arcata, California 95521, (707) 826-3561. The University is an Equal Opportunity/Title IX Employer.



The NEWSLETTER of the Fish Health Section of the American Fisheries Society is published four times annually in accordance with Section objectives and mailed to the Section membership in good standing at the time of publication. The use of company or registered trade names does not constitute an endorsement but serves only to keep members informed. Contributions to the NEWSLETTER are encouraged and should be sent to one of the following Committee members no later than the 15th of May to be included in the next quarterly issue. The Newsletter Committee members include:

Dr. Joseph R. Sullivan (editor), Dept. of Fisheries,  
School of Natural Resources, Humboldt State  
University, Arcata, CA 95521  
Dr. Mark Dulin, 1403 Clark Street, Ames, Iowa 50010  
Dr. Joe Geraci, Pathology Dept., University of Guelph, OVC,  
Guelph, Ontario, Canada N1G 2W1  
Dr. Glenn Hoffman, Parasitologist, U.S. Fish and Wildlife  
Service, Fish Farming Experimental Station, P. O. Box  
860, Stuttgart, AR 72160  
Mr. Paul Janeke, U.S. Fish and Wildlife Service, Fish  
Disease Control Center, 1100 E. Burlington Ave., P. O.  
Box 917, Fort Morgan, CO 80701

## LATE BUT HOT!

Civil Service Application in Microbiology to be accepted -- an amendment to announcement #421, LIFE SCIENCES, is effective through June 30, 1978. Interested persons should get announcement #421 from the post office for information on procedure. Applications for Microbiology, GS-5/7 (\$9,959 - 12,336) will be accepted by the Raleigh, N.C. Civil Service Office June 1 - June 29, 1978. All other life sciences applications GS - 9/12 (\$5,090 - \$21,883) will be accepted by the Washington, D.C. Civil Service Office from May 15 through June 2, 1978. In addition to form 171, and anything else mentioned in announcement #421, persons desiring government work in fish disease at grade 9/12 should also submit a college transcript.

Dr. Joseph R. Sullivan, Editor  
Dept. of Fisheries  
School of Natural Resources  
Humboldt State University  
Arcata, CA 95521



Dr. Glenn L. Hoffman  
Fish Farming Exp. Stat.  
P.O. Box 860  
Stuttgart, AR 72160