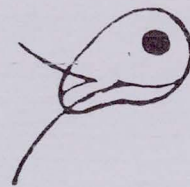


FISH HEALTH SECTION

A S F

NEWS LETTER



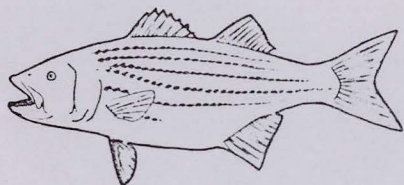
Volume 16, Number 4

Fall 1988

PRESIDENTIAL MESSAGES - PAST AND PRESENT

FROM THE PRESENT DOUG ANDERSON

It is an extraordinary privilege to serve as President of the Fish Health Section during this time of growth in fish farming and aquaculture, and of rapid developments in the use of new scientific techniques for keeping fish healthy. We can be proud that new methods in diagnostics, in the use of drugs and antibiotic for therapy and prophylaxis, and in immunization programs for improved fish health are coming from members of the Fish Health Section. We are drawing people who are sincerely motivated and highly professional into joining the FHS. New members in our organization reflect the world-wide interest in our field. During the last twenty-five years, the Fish Health Section has steadily grown from a core of about 30 members to over 550 without an intensive membership recruitment program. The 1988 Vancouver, B.C. International Fish Health Meeting this summer dramatically demonstrated the size of international audience interested in fish health. I want to draw more fish health specialists into our Section, so this year we are initiating a membership drive and striving to invigorate our own to be more involved. Many of our present members are "information-drawers", rather than people who actively input information to the membership, the FHS Newsletter or interact strongly with others in the FHS group as a whole. We need more involvement of our members to ensure that we attract and keep in communication with people who are continuing with fish health. Please spread the word around to your friends, fish pathologists, biologists, environmentalists, laboratory scientists, administrators, and other people who you know have major interests in supporting fish health and management, treatment, and research on disease-causing agents. The AFS/FSH is open to specialized groups forming within our Section, and these can help us all be up-to-date and aware of current trends in our field. A recruitment membership folder will be enclosed in a future Newsletter; copies are now available from me or Membership and Balloting Chair, Kathleen Hopper.



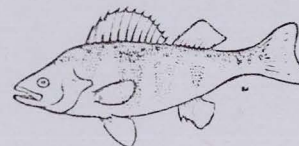
FROM THE PAST RON HEDRICK

This last year has been a busy and I think productive one for the Fish Health Section. After being at the helm for one year I have no regrets about making way for the new President, Doug Anderson. The Section will be in very capable hands during his tenure.

Certain events will remind me of this last year as time passes. The International Meeting was a huge success and really indicated to a lot of us how large the international Fish Health community has become. Realization of our new "Journal of Aquatic Animal Health" was another key event in the Section's development. Completion and administration of the examination for certification at the Vancouver meeting was another landmark. Other events which have been initiated and will soon surface are the Shellfish Bluebook and the Long Range Plan.

Working as President also provided me with a view of what makes the Section move . . . individuals. We have some really dedicated folks who put a lot of time into making the section work. For each of the major events mentioned above some key individuals were critical to the effort: Trevor Evelyn cannot be given enough credit for his outstanding contribution to the International Meeting. Bill Rogers got the whole ball rolling on the new journal and is now the Technical editor with John Plumb and John Grizzle assisting. Several individuals are assisting me on the Shellfish Bluebook and Long Range planning. John Schacte, Spike Bealeau and many others got the examination and certification programs to the final stages this year. The officers and committee members of the Section worked hard all year and I thank each of them for these efforts. John Rohovec continued to coordinate the publication of our quality newsletter . . . his long hours of devotion often go unrecognized. These are just a few of the many dedicated folks that I was pleased to work with during my presidency. I thank you all.

My goals as past president will be to finish up some of the projects which were initiated during the year and to help make the Section a more proactive rather than reactive body. There are a lot of changes we can make and things we can do as a professional society that we have only dabbled with in the past. With the creation of the Long Range Plan I hope we will have the document to make this transition in an orderly and directed fashion. Again thanks to all of you, I enjoyed serving you.



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FHS OFFICERS AND COMMITTEES 1988-1989

EXECUTIVE COMMITTEE

Voting Members

Doug Anderson, Chair and President, FHS
John Schachte, President-Elect
Ron Hedrick, Immediate Past President
Vicki Blazer, Secretary-Treasurer
Craig Banner, Chair, Nominating Committee

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Pete Bullock, Awards Committee
Kathleen Hopper, Membership and Balloting Committee
John Cvitanich, Professional Standards Committee
Joe Sullivan, Board of Certification
Rod Horner, Technical Procedures Committee
Margaret Ewing, Archives Committee
Paul Reno, Time and Place Committee
Bill Rogers, Scientific Journal

STANDING COMMITTEES

Nominating

Craig Banner, Chair
Marshall Bealeu (2 years)
Rich Holt (3 years)

Newsletter

John Rohovec, Chair
Jim Winton
Randy MacMillan
Paul Bowser
Ron Thune
Ellen Oman
Rod Getchell

Technical Procedures

Rod Horner, Chair
Kevin Amos
Dennis Anderson
Jim Warren

Professional Standards

John Cvitanich, Chair
Mike Kent
Martin Chen
Joe Sullivan
Roger Herman

Board of Certification

Joe Sullivan, Chair
Drew Mitchell (1 year)
Ted Meyers (2 years)
Ralph Elston (3 years)
Paul Janeke (3 years)

Finance

Vicki Blazer, Chair
Kathleen Hopper (Membership)
John Rohovec (Newsletter)

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Pete Bullock, Chair
John Fryer (2 years)
Fred Meyer (3 years)

Archives

Margaret Ewing, Chair
Tony Amandi (2 years)
Glenn Hoffman (3 years)

Time and Place

Paul Reno, Chair
Ron Hedrick (2 years)
Ed Noga (3 years)

AD HOC COMMITTEES

Program (1990 meeting)

John Schachte, Chair
Rod Horner
Charles Suppes
Joe Marcino

International Standards

Trevor Evelyn
Bruce Nicholson
Barry Hill
Pierre de Kinkelin
Victoria Rasheed
Hisatsuga Wakabayashi

Procedures Evaluation

*Emmett Shotts, Chair
(*Streptococcus*, *Lactobacillus*)
*John Hawke
(*Edwardsiella ictaluri*)
*Yolanda Brady (CCV)
Phyllis Barney
*Cliff Starlipper (*Flexibacter*,
gill diseases)
Howard Jackson
Ron Hedrick
*Diane Elliott
(*Aeromonas salmonicida*)
*Robert Durborow
(Warmwater parasites)
*Roselynn Stevenson
(*Yersinia ruckeri*)
Jeff Teska
*Phil McAllister (VHSV)
*Russ Kelly (IPNV)

Long Range Projects & Planning

Ron Hedrick
Standing Committee Chairs

Scientific Journal

Bill Rogers, Chair
John Plumb
John Grizzle

Blue Book Field Advisory

John Thoesen, Chair
*Scott LaPatra (IHNV)
*Jack Frimeth
(Coldwater parasites)
Chris Horsch
Diane Elliott
Steve Roberts (*Renibacterium*)
Jack Ganzhorn (*Vibrio*)

POLAND HONORS SNIESZKO

The late Dr. S.F. Snieszko, one of the world's leading fish pathologists and for many years director of research at the National Fisheries Center in Leetown, was recently recognized by the Inland Fisheries Institute, to the fisheries sciences.

A brass plaque, inscribed in both English and Polish with, "In honor of the Great Scientist, Professor Stanislaw F. Snieszko, Inland Fisheries Institute, Poland" has been presented to the National Fish Health Research Laboratory and is now displayed in the lobby next to a portrait of Snieszko.

Snieszko, who died in 1984, was a native of Poland. He came to this country before the hostilities in Europe and served in the army Chemical Corps at Camp Detrick, MD, until 1946 when he began his fisheries research career at Leetown. In addition to his research efforts, he was a noted author, lecturer, teacher, editor, consultant and administrator. Throughout his career, he was recipient of numerous awards and honors both here and from abroad. Although he retired in 1972, he continued his work until the time of his death.

Among those initiating the honor were professor Dr. Jan Szczerbowski, director of the institute, assistant professor M. Studnicka, and Drs. A.K. Siwicki, A. Kruger and Z. Okoniewski.

CONCERNS EXPRESSED BY PARTICIPANTS AT THE 1988 EASTERN FISH DISEASE WORKSHOP, UNIVERSITY OF MAINE, ORONO, ME

edited by

David B. Groman, Ph.D.

Fish Health Unit, Atlantic Veterinary College
University of Prince Edward Island, PEI, Canada

- A) Development of nonlethal sampling methods, especially for broodstock.
- B) Improvement and/or development of more rapid viral diagnostic techniques; i.e., DNA probes, FA on post mortem tissues.
- C) Standardization of viral information and serological methods, and moving any new technology quickly into established regulations and technical procedures for fish health diagnosis.
- D) Improved standardization in all areas of biologics. A definite need to assign centers for antisera production, distribution and quality control.
- E) A need to better define the nature and direction of the research wing of the US Fish & Wildlife Service in the field of fish health.
- F) Role of private companies in the production of biologics.
- G) Need for aquaculture industry feedback and R&D funding on biologics development and research.
- H) Need for professional society, i.e. FHS, to address collectively the ramifications of malpractice and insurance.
 - I) Need to develop legal means of handling regional emergencies concerning highly virulent disease outbreaks, i.e. establishing contingency protocols for reporting elimination and reimbursement.
 - J) Need to develop regional continuing education packages to update current field personnel on diagnostic techniques and training incoming diagnostician and researchers.
- K) Need to include a broader range of standardized diagnostic procedure for identifying pathogens of species other than salmonids and catfish; i.e., golden shiner industry, striped bass, flatfish.

PASSAGES

Mike Kent has moved from Battelle Labs to take a two year research position at the Pacific Biological Station, Nanaimo, B.C., Canada V9R5K6. His new telephone number is 604-756-7119.

Anadromous Inc. has new addresses for their Pathology Lab and Administration. The lab is now located at 188 West B St., Springfield, OR 97477. The phone is 503-746-1442. Administrative offices are at 777 NE 2nd St., Corvallis, OR 97330, phone 503-757-7301.

Jim Warren's new address is: USFWS, Fisheries, 500 N.E. Multnomah St., Suite 1692, Portland, OR 97232.

*Designates Disease Committee Network Chairs

MONOCLONAL ANTIBODY PRODUCED AGAINST VIRAL HEMORRHAGIC SEPTICEMIA VIRUS

*P.E. McAllister and W. J. Owens
National Fish Health Research Laboratory, Box 700
Kearneysville, WV 25430*

Viral hemorrhagic septicemia virus (VHSV) causes a serious disease that affects primarily rainbow trout (*Salmo gairdneri*) and brown trout (*Salmo trutta*). The virus is enzootic to much of continental Europe and can be isolated from cultured and wild fish populations. Many nations require that imported salmonid fish and fish products be certified free from VHSV.

Three distinct serotypes of VHSV (F1, F2, and 23.75) can be distinguished by infectivity neutralization assay in cell culture. Specific antiserum to each serotype is most often prepared in rabbits. VHSV is noted for being a weak stimulus for antibody production, and consequently, VHSV antisera generally have low-level virus-neutralizing activity. Hybridoma cell lines that secrete monoclonal antibody specific for VHS virus are an alternative to antiserum production in animals. The hybridoma cell lines are cultured using routine procedures and provide a continuous supply of specific antibody that can be standardized.

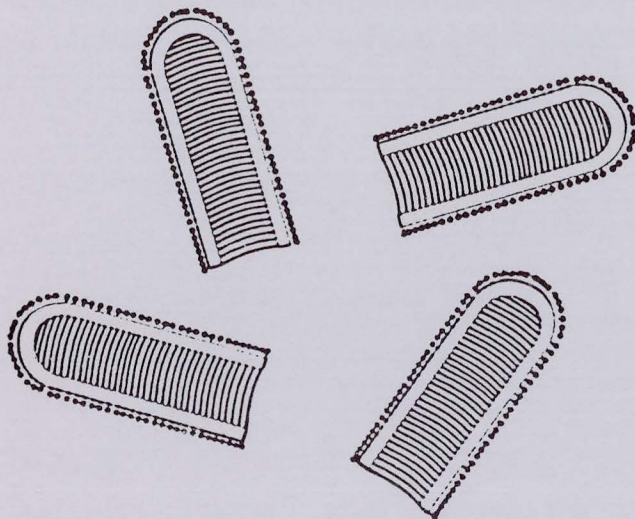
Antibody-Secreting Cell Lines Were Prepared

We have established twenty hybridoma cell lines that secrete antibody against VHSV. Mice were inoculated with VHSV, and antibody-producing spleen cells from the mice were fused with mouse tumor cells to initiate the hybridoma cell lines. From the 20 hybrid cell lines produced, four of the cell lines have been cloned, expanded, and characterized. All four cell lines secrete IgG-type antibody.

Monoclonal Antibody Binds All Three Serotypes

The monoclonal antibody has been concentrated and purified by affinity chromatography and is reactive in immunoblot and other enzyme-linked immunosorbent assay (ELISA) systems used to identify salmonid fish viruses. The antibody binds all three VHSV serotypes, but does not neutralize them. Further, the monoclonal antibody reacts with both infectious and inactivated virus preparations of all three serotypes. The monoclonal IgG does not react with infectious hematopoietic necrosis virus, infectious pancreatic necrosis virus, or cell culture media.

The hybridoma cell lines offer an alternative source of VHSV-specific antibody. The cell lines are easily managed, and the antibody is compatible with existing ELISA virus identification systems. Some cell lines and a composite monoclonal antibody are available on request.



POLYETHYLENE GLYCOL USE FOR VIRAL ASSAY IN THE DIAGNOSTIC LABORATORY

*Ray Brunson, Jan Yancey, Kim True
U.S. Fish and Wildlife Service
Olympia Fish Health Center
2625 Parkmont Lane, Bldg. A
Olympia, WA 98502*

The report by Bill Batts, Seattle National Fisheries Research Center, in the January 1988 Fish Health News prompted our staff to investigate the use of polyethylene glycol (PEG) for routine viral diagnostics and certifications.

In order to avoid pretreatment of preformed cell sheets, we compared 7%, 10%, and 14% concentrations of PEG within our antibiotic decontamination dilution mix that we routinely use for sample processing. Log dilutions (10^0 through 10^6) of control IHN virus were added 1:1 to make final concentrations of 3.5%, 5%, and 7% PEG. Incubation time in the antibiotics was two hours. Both 20 min and 60 min adsorption times onto replicate CHSE-214 and EPC cell plates were tested. All tests were compared with a control that did not contain PEG in the antibiotic mix.

Our results indicate that PEG used in the antibiotic mixture and inoculated with the sample onto the cell plate gave results similar to the pre-treatment of the cell sheet reported by Batts. All PEG concentrations enhanced sensitivity and gave more rapid viral detection. The 7% concentration gave consistently better results than either of the lower concentrations, and provided five- to ten-fold increase in sensitivity over the non-PEG treated controls.

The ability to detect IHN virus was not noticeably different between plates using 30 min and 60 min adsorption periods, but it should be noted that we use a rotator plate to gently swirl the plates during incubation.

We tested an autoclaved solution of PEG to make our antibiotic incubation solution. This was compared to a solution that was prepared from non-autoclaved PEG. We found an approximate two-fold reduction of plaque forming units in the autoclaved PEG based solution when plated onto either CHSE-214 or EPC cell lines. This may indicate a need to sacrifice absolute sterility for increased sensitivity, but antibiotics seem adequate to hold down bacterial contamination.

We also tested the 7% PEG final antibiotic mix for IPN virus detection and found neither enhancement nor reduction in sensitivity.

From these results, we started using PEG routinely in our antibiotic mixture for ease of use and increased sensitivity to IHN virus. Perhaps others can test the procedure for themselves and share any information on their experiences with PEG.

BRIEF REPORT

The U.S. Fish and Wildlife Service (Service) recently obtained a ruling from the U.S. Food and Drug Administration (FDA) that allows the use of benzethonium chloride (Hyamine 1622) and benzalkonium chloride (Hyamine 3500, Roccal) to disinfect water, gear, and tanks during routine fish production operations. The disinfection can occur at concentrations of up to 2 ppm active ingredient. This ruling is similar to that obtained on iodophors by the Service from FDA. Rosalie A. Schnick, Section of Technical Information, National Fisheries Research Center, La Crosse, Wisconsin.

Recruit a new Fish Health Section member today!

A SIMPLE TECHNIQUE FOR ACCELERATING THE GROWTH OF THE KIDNEY DISEASE BACTERIUM ON AGAR MEDIA

Evelyn, T.P.T., L. Prosperi-Porta, and J.E. Ketcheson
Department of Fisheries and Oceans,
Biological Sciences Branch
Pacific Biological Station
Nanaimo, B.C., Canada V9R 5K6

Renibacterium salmoninarum (Rs), the bacterium responsible for kidney disease in salmonids, is a notoriously slow-growing organism. With lightly infected samples such as those derived from subclinical infections, incubation times of from 3 to 6 weeks are commonly required for visible growth of the pathogen. In fact, one group of researchers recently advised using incubation periods of 12 weeks before considering samples negative for Rs (Gudmundsdottir et al. 1988. Fish Health Section, American Fisheries Society Conference Handbook, p. 81). This slow-growing property of Rs has discouraged research on the pathogen and has led to the development of non-cultural techniques for its detection.

In this report, we describe a simple technique for significantly accelerating the growth of Rs. The technique is based on the well-known phenomenon, referred to as "satellitism" or "cross-feeding," in which a fastidious organism is induced to grow by placing it on an agar medium next to a non-fastidious "feeder" or "nurse" organism. In the present procedure, the "nurse" organism is actually a stock culture of Rs. A heavy suspension of the "nurse" culture (25.0 uL of a 2.0 OD_{420 nm} peptone (0.1%)-saline (0.9%) suspension) is drop-inoculated onto the center of a plate of the kidney disease medium, care being taken not to spatter the suspension over the plate. Samples suspected of containing Rs cells are then drop-inoculated, peripherally, on the plate. The plate is then incubated at 15°C using the precautions described earlier (Evelyn, 1977. Bull. Off. Int. Epizoot. 87:511-513). Rapid growth of the "nurse" culture invariably results, and this growth conditions the medium in a manner that markedly accelerates the growth of any Rs cells present in the peripherally-located samples. The technique yields repeatable results, with incubation times for visible colony formation in the samples being significantly reduced. It should facilitate the detection of the viable pathogen in samples from overtly infected fish and should prove useful in research projects in which there is a need to culture and/or to enumerate the viable pathogen. Table 1 illustrates typical results obtained with two types of samples: 1) a lightly infected kidney sample derived from an Rs-infected fish and 2) a sample containing a recent Rs isolate in which the Rs cell numbers were diluted almost to extinction.

Table 1. Time to formation of countable *Renibacterium salmoninarum* (Rs) colonies in the presence and absence of an Rs "nurse" culture.

Sample	No. of Rs colonies in replicate 25.0 uL drops of sample		Incubation time (days)
	"Nurse" culture present	"Nurse" culture absent ¹	
Rs-infected kidney (homogenized)	34,39,43,43	0,0,0,0	12
Rs cell suspension	7,7,5,4	0,0,0,0	14

¹In the absence of the nurse culture, countable colonies (29,32,33,37) were evident by 23 days with the kidney sample but were still lacking at 28 days with the Rs cell suspension.

SONICATING KIDNEY TISSUE TO ENHANCE LIBERATION OF RENIBACTERIUM SALMONINARUM CELLS

Steve Leek
Lower Columbia River Fish Health Center
Underwood, WA 98651

Our normal procedure for assessing prevalence of *Renibacterium salmoninarum* in fish populations is using a grab sample of 60 fish midway in the pond. A small piece of kidney is centrally excised aseptically from each fish or a cotton swab is used on the full length of the kidney and then smeared on a microscope slide. In populations with covert infections there are usually few bacteria seen. This makes any decision extremely difficult regarding prevalence of infection.

A test was set up using kidneys from spring chinook salmon (SCS) to determine if disruption of tissue with sonication would free more *Renibacterium salmoninarum* for detection compared to just freezing or freezing and homogenizing. The entire kidney was aseptically removed from each of 222 fish from a population of 343,170 for this test.

The fish were anesthetized, measured, and examined visually for abnormalities before the kidney was removed. Kidneys were placed in stomacher bags for freezing at -10°C. Samples were later thawed and a small portion from each placed on a slide and smeared. The remaining sample was then homogenized by using a stomacher and a slide was prepared from this tissue. The remaining tissue was placed in a 1.5 ml polypropylene micro-centrifuge test tube and PBS was added to bring the volume up to 0.5 ml. This tissue was sonicated two times for one second bursts at a gauge reading of 30 to 40 using a Tekmar Sonic Disrupter Model TM250B. The micro probe was cleaned between samples by wiping with a Kimwipe and then using methanol and another Kimwipe to wipe the surface two times. The tubes were centrifuged. The supernatant was discarded and remaining tissue was placed on a slide and smeared. A China Marker "71 Red" was used to make a circle approximately 1 cm in diameter in the center of the slide after smearing. This serves two purposes: 1) it keeps the conjugate from creeping on the slide and 2) it serves as a reference point while viewing (it is highly orange fluorescent). Fluorescent antibody technique (FAT) "Blue Book" procedures were followed for staining. Slides were examined using 1000X until the entire area (about 300 fields) had been scanned. The time for scanning each slide varied from 5 to 9 minutes (time was not recorded).

Two-hundred twenty-two slides were prepared each from sonicated, homogenized, and frozen tissue. (Frozen sample was prepared before homogenizing.)

Some fish had been fed Abernathy dry feed from June 1, 1987 to October 1, 1987. Others received Bio-Moist feed the entire time. Fish in one pond were progeny from parents that had high levels of soluble *R. salmoninarum* antigen determined from enzyme linked immunosorbant assay (ELISA) tests on adult kidney tissue at spawning time. All other fish came from parents with lower levels of antigen.

There were 7 bacteria seen on the 222 slides from frozen and 21 bacteria from the 222 homogenized samples. Two hundred ten bacteria were seen on the 222 slides from the homogenized and sonicated samples. Fifty of the slides were positive for *R. salmoninarum* (22.5%) and all but 7 were detected with sonicated samples. Twelve of the samples were detected using frozen or homogenized tissue.

Sonication frees more bacteria from host tissue than just freezing or homogenizing, but when only small numbers of bacteria are present it appears only a matter of chance they are observed.

The group originating from parents with elevated *R. salmoninarum* soluble antigen at spawning time had the lowest prevalence of bacteria. The fish fed dry and moist diets had a prevalence of 31.0% and 15.6% respectively. Five of the ponds had low levels of infection. It cannot be determined if the infection is caused by vertical transmission or is a result of horizontal transmission caused by anadromous and resident fish in the water supply.



GEOGRAPHIC DISTRIBUTION OF, AND SPECIES SUSCEPTIBILITY TO, A TOXICOPATHIC LIVER DISEASE

Michael L. Kent

Department of Fisheries and Oceans,
Biological Sciences Branch
Pacific Biological Station
Nanaimo, B.C., Canada V9R 5K6

A severe liver disease of Atlantic salmon (*Salmo salar*) occurred in Port Townsend Bay, Washington, in the summers of 1986 and 1987 (Kent, et al. 1988. Dis. Aquat. Org. 4:91-100), and again in the summer of 1988. The 1988 cases involved Atlantic salmon smolts, chinook salmon (*Oncorhynchus tshawytscha*) (approximately 10 g), and steelhead X rainbow trout (*Salmo gairdneri*) (approximately 400 g). Identical liver lesions were also observed in Atlantic salmon smolts at four netpen sites in British Columbia.

The disease is most likely caused by a water-borne toxicant, the source and identity of which remains unknown. Extensive chemical analysis conducted by the Washington Department of Ecology on affected tissues, sediment, and water revealed no unusual occurrence of toxic chemicals. This, along with the observations in British Columbia of the disease at several apparently unpolluted sites, indicates that this agent is a natural toxin. An algal toxin is a likely candidate, particularly because the disease invariably occurs during the summer. The liver lesions are remarkably similar to those induced in rainbow trout by feeding pyrrolizidine alkaloids (Hendricks, et al. 1981. Exp. Mol. Pathol. 35:170-183). However, these toxins have yet to be identified in marine algae.

BIBLIOGRAPHY COMPLETED

"A Bibliography of the Early Life History of Fishes", by Robert D. Hoyt, Western Kentucky University, Bowling Green, KY.

An indexed bibliography of early life history stages of fishes featuring reproductive, egg, embryo, larval, and juvenile literature. The bibliography is comprehensive in scope including 13,717 works produced from 1842 to July 1987. The two-volume, 980 page set is under soft cover and spiral bound for ease of use. Copies may be obtained for \$55 from Robert D. Hoyt, Department of Biology, Western Kentucky University, Bowling Green, KY 42101.

THREE TRANSLATED BOOKS AVAILABLE

Glenn L. Hoffman, USFWS, (retired)
Rt. 3, Box 36
Kearneysville, WV 25430

A limited number of free copies of three recently translated books are available. These were translated and published under PL 480 for the United States Department of Interior and the National Science Foundation. The translator/publisher was Amerind Publishing Co. Pvt. Ltd., 66 Janpeth, New Delhi 11001 India. The three books are:

1. Skarlato, O.A. (editor), 1977. Investigation of Monogeneans in the USSR. Papers Presented at the All-Union Symposium on Monogeneans. TT 79-52038, 181 pp.
2. Izyumova, N.A., 1977. Parasitic Fauna of Reservoir Fishes of the USSR and Its Evolution. TT 79-52044, 325 pp.
3. Ginetsinskaya, T.A., 1968. Trematodes, Their Life Cycles, Biology and Evolution. TT 77-52042. 559 pp.

For free copies contact Drew Mitchell, Fish Farming Experimental Laboratory, USFWS, Box 860, Stuttgart, AR 72160. After free copies are gone, contact (1) U.S. Dept. of Commerce, National Technical Information Service, Springfield, VA 22161, or (2) Amerind Publishing Co. Pvt. Ltd., 66 Janpeth, New Delhi 110001, India.

JOB OPPORTUNITIES

The University of Maryland Center for Environmental and Estuarine Studies, Horn Point Environmental Laboratories (HPEL) and the UM Sea Grant Extension Program seeks to appoint a tenure-track position at the Assistant/Associate Professor level. The successful applicant will be responsible for development of a research program in aquaculture associated diseases which should complement existing University and State programs in aquaculture research. Research will be directed toward identification, treatment, prevention and cure of diseases of shellfish and finfish with major emphasis being with oysters and striped bass.

Extension responsibilities will be coordinated by the University's Sea Grant Extension program of the Cooperative Extension. Send CV and names of 3 references by 1 January 1989 to Dr. R. Harrell, Horn Point Environmental Laboratories, UMCEES, P.O. Box 775, Cambridge, MD 21613. The UM is an AA/EOE.

Aquatic Animal Medicine/Pathology Position

*Univ Pa
Woods
Hole*

The University of Pennsylvania, School of Veterinary Medicine, is seeking a highly qualified individual for a tenure track faculty position in Aquatic Animal Medicine/Pathology. Applicants should possess a veterinary degree, ACVP board certification, and preferably have a Ph.D. or equivalent research training and experience. Primary responsibilities will include Directorship of the Laboratory for Marine Animal Health at the Marine Biological Laboratory in Woods Hole, Massachusetts, conduct of research on diseases of marine animals, provision of diagnostic services for the Woods Hole scientific community, and instruction of veterinary students and graduate students. Rank and salary will be commensurate with qualifications and experience. Applicants should submit a curriculum vitae and names of 3 references to Dr. Donald A. Abt, School of Veterinary Medicine, University of Pennsylvania, 3800 Spruce Street, Philadelphia, PA 19104-6044.

The University of Pennsylvania is an equal opportunity/affirmative action employer.

1989 FISH DISEASE SHORT COURSE

Wellborn

This is to announce the short course "Diagnosis and Treatment of Diseases of Warmwater Fish" (FNR 6934) will be taught at the University of Florida on June 12-23, 1989.

This short course is to provide instruction in the methodology of diagnosis and treatment of parasitic, bacterial, viral, nutritional, and environmental diseases of warmwater fish. Four hours of college credit is available to graduate and undergraduate students. Tuition for Florida residents is \$64.58 per credit hour. For non-residents tuition is \$189.53 per credit hour. Those wishing to participate in the course without receiving any college credit may do so by paying a \$200 registration fee in lieu of tuition.

This course is limited to 24 persons, and applications must be received on or before March 15, 1989. Persons interested in taking the course should apply by writing Dr. Thomas L. Wellborn, Jr. All applicants will be advised whether or not they have been accepted to attend before April 15, 1989.

Students will be expected to provide their own compound microscope and dissecting kit for use in the laboratory. However, a limited number of microscopes will be available for those people who do not have access to one.

Instructors for the course will be Dr. Thomas L. Wellborn, Jr., Professor, Department of Fisheries and Aquaculture, University of Florida, and Dr. Ruth Francis-Floyd, IFAS Extension Veterinarian, College of Veterinary Medicine, University of Florida.

Reply to Tom Wellborn
Rt. 1 Box 754
Blountstown, FL 32424

STATE OF THE FISH HEALTH SECTION - 1988

Doug Anderson
Fish Health Section President

The Fish Health Section (FHS) of the American Fisheries Society (AFS) has over 550 members. We are people from varied disciplines with a tremendous expertise in fish health and belong to the FHS because we want to be informed about what's happening in our field and tell others about our work. The FHS Newsletter, the new Journal of Aquatic Animal Health, meeting abstracts and other publications give us professional credibility. The following lists some of my thoughts and concerns as President.

AMERICAN FISHERIES SOCIETY

The FHS membership is through the AFS parent society, headquartered in Bethesda, Maryland. The advantages of this association are many:

1. The AFS is a highly visible, professional organization.
2. Dues are collected by the AFS.
3. They advertise and sell our publications.
4. Certificates and awards are prepared professionally by the AFS.
5. AFS dues include a subscription to the magazine FISHERIES.
6. AFS sponsors annual meetings.
7. The AFS accesses about 7500 members.
8. The subscription rate for the new Journal of Aquatic Animal Health is reduced for AFS/FHS members.

Disadvantages to be considered:

1. The cost of an extra \$42/year to access the FHS.
2. Not all FHS members might agree with some policies of the AFS parent.

NEWSLETTERS

Many members are attracted to join the FHS for the subscription to the FHS Newsletter. The 4-8 page quarterly publication is now edited by Drs. John Rohovec (Corvallis, Oregon) and Jim Winton (Seattle, Washington) and printed in Corvallis. They are assisted by a competent committee and dependent upon the membership for support. The FHS Newsletter is a highly successful, visible, world-recognized publication greatly due to the organizational abilities of the editors. **We solicit and appreciate the contributors of scientific articles, letters, and notices from the entire FHS membership.**

BLUE BOOK

The FHS Blue Book is a 114-page manual giving procedures for the detection and identification of certain fish pathogens. While techniques, concepts and epidemiology are constantly being revised, and better methods developed, the Blue Book fills an important niche in guiding pathologists, administrators and fish farmers on transportation of fish across natural and man-made boundaries, disease classifications, etc. **Support this publication.**

MEMBERSHIP DIRECTORY

Communication with biologists in similar fish health specialties can be accessed through the FHS Membership Directory. This important booklet, last published in 1986, has been distributed to each member, and contains information of interests, agencies and telephone numbers. It also contains the by-laws and requirements for certification to Fish Pathologists or Fish Health Inspectors. **Keep a copy on your desk; communicate!**

CERTIFICATION PROGRAM

For certain professional functions, pathologists are granted by their peers certificates that state this person has the training and ability to state an opinion or judgment with authority. Presently the FHS has two levels of certification: the Fish Pathologist, and the Fish Health Inspector. In addition to other more strict requirements, the former requires that a comprehensive exam be taken. The first exam was given in the summer of 1988. **This is a highly important, credible program.**

JOURNAL OF AQUATIC ANIMAL HEALTH

The AFS has agreed to publish a new journal sponsored by the FHS. The editors are Drs. Bill Rogers, John Plumb, and John Grizzle (Auburn, Alabama). The first issue will consist of papers selected from the presentations at the International Meeting in Vancouver, British Columbia, July 19-23, 1988. **This is an exciting professional advancement for the FHS; please give full support! Submit scientific papers.**

PROJECTS THAT NEED TO BE CONSIDERED FOR ACTION

ACCESSIBLE MEMORY DISCS

We need to have the Blue Book and Membership Directory on retrievable memory discs so that updating can be easily done.

RESOURCE MANUAL

A Resource Directory giving listings of university, private, governmental, and foreign fish health centers for training and health inspections should be assembled. It should be comprehensive, giving lists of contact personnel, telephone numbers, and a complete index.

SHELLFISH HEALTH BOOK

The Shellfish Health Guide is currently being assembled to act similarly as the Blue Book for fishes. This is an important development.

ASYMPTOMATIC GUIDE

Subclinical

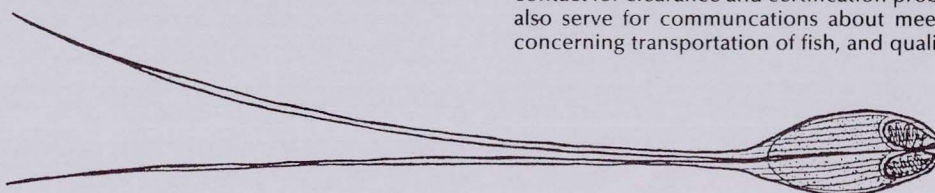
There is a great concern about detection of pathogenic viruses, bacteria and protozoans in asymptomatic carrier fish. Many new techniques and assays are being proposed as pathologists and researchers develop ways to find low numbers of infectious agents in fish. An updated guide booklet form should be available and complement the Blue Book.

FISH DISEASE NETWORK

The Fish Health Section members hold an incredibly valuable, informative resource on the different aspects of fish diseases. We need to be able to tap the experts when questions about individual fish disease problems arise that are beyond our own experience. A Fish Disease Network, combining people with updated research information, field experience, academic backgrounds and administrative training is being set up for this purpose.

INTERNATIONAL STANDARDS COMMITTEE

It's important for the AFS/FHS members to communicate with other fish pathologists around the world. In problems of international shipments of fish and fish products, authorities need to know who to contact for clearance and certification problems. This committee will also serve for communications about meetings, significant changes concerning transportation of fish, and qualifications of personnel.



Special Contribution

COMMENTS ON THE REGULATION OF AQUATIC ANIMAL TRANSPORTS

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Over the past several years of working with commercial aquaculturists, I have developed some perspective on the subject of transportation of fish and shellfish as this activity pertains to posing a risk for spreading infectious diseases. I'd like to share these ideas with you and perhaps stimulate a dialogue on the subject. I'm not going to discuss every facet of disease control regulation or all the details of proposed approaches to this issue, such as that of the International Council for the Exploration of the Seas (I.C.E.S.) Working Group on Introductions and Transfers of Marine Organisms, but rather I wish to recount some general views as shaped by my experiences in working with both industry and government on these issues.

I think we all agree that we need some level of control on the transport of fish and shellfish in order to prevent the damaging effects which infectious diseases can have on both husbanded and natural populations of aquatic animals when spread to uninfected populations. It is important to recognize that workable regulations can reduce, but never eliminate, the risks of such diseases. Ineffective regulatory control of infectious disease can result from either no regulation on the one hand or, on the other hand, from an attempt to eliminate the risk posed by infectious diseases by a too conservative and unrealistic approach to the problem of disease control. Overzealous regulation, without a substantial technical base and without recognition of the realities of animal transports, simply encourages individuals and companies to disregard the law. There is no practical way that animal transport regulations can be effective without voluntary and active support by the user groups.

I believe that the transportation of aquatic animals throughout the continent of North America or between North America and other continents is inevitable. Often the aquaculture industry is regarded as the primary practitioner of this activity. In fact, the transport of aquatic animals or their tissues, which may contain viable infectious agents, is practiced by several other user groups. These include commodity distribution of harvested or husbanded fishery products, the movement of aquatic animals for research purposes and movement of fish and shellfish by the general public. I have often felt that the aquaculture industry has been unfairly targeted as the primary offender in irresponsible aquatic transports. As you all know, the most catastrophic damage which can result from the introduction of an infectious disease does not necessarily occur from the movement of large numbers of a single species. I have at some times been appalled by the cavalier attitude of some researchers and resource management biologists who somehow rationalize that animal transport regulations do not apply to them, even though serious damage could result from the movement of a small number of animals which carry non-indigenous pathogens. I suspect that a larger diversity of aquatic animals is moved by the research community than by the aquaculture industry. The control of the spread of infectious disease organisms through commodity distribution activities are not usually covered by the same, if any, regulations which pertain to aquaculture products. And, although regulations may forbid the movement of aquatic animals by the public, these regulations are difficult, if not impossible, to enforce.

If these are the problems, what can we do to reduce the risk of spreading infectious aquatic animal diseases? Education is a key area needing attention. We can target education to the aquaculture industry relatively easily. My view is that the industry will act responsibly when it recognizes that disease control is in its own interest and that such education will encourage self enforcement efforts - the most effective means of enforcement of disease control regulations. I think that those of us in the fish health field are the most effective professionals to educate the industry through workshops, publications and taking the opportunity to speak on this subject where appropriate. As fish health professionals we should begin a dialogue on how to effectively extend this education to the general public and other user groups involved in commodity distribution.

I believe that we should strive toward enacting regulation which is based on substantial technical information rather than incomplete information. If we are going to forbid movement of a particular animal species when it carries a particular disease, it should be because this disease is truly exotic to certain areas. While it is not a good practice to move animals which are sick, I think, from a regulatory point of view, we cannot reasonably attempt to control the movement of disease organisms from one enzootic area to another. Regulations should be formulated with a view toward protecting both natural resources and the aquatic animal husbandry industry. Finally, and perhaps most importantly, we need to devise ways to address all avenues of risk for the introduction of aquatic animal diseases, not just the most visible easily targeted avenues of risk such as the aquaculture industry.

There are certainly some outstanding technical needs if we are going to effectively prevent the spread of infectious aquatic animal diseases. We need to develop complete regional inventories of diseases. This is not the most glamorous research problem nor, necessarily, the highest priority of fisheries management agencies, but a disease inventory is one of the key elements on which effective disease control is based. We cannot rationalize excluding a disease or species from a region if we do not know of its presence or absence from that region and conversely, we cannot know the risk of moving an animal population if we do not have a good idea of the diseases it harbors. We also need information on the significance of a given disease for all of the life stages of fish or shellfish which it affects. As fish health professionals, we know there is a great variety of pathogens and parasites found on host animals. Obviously some of these are much more important than others in their effects on the host. If we can strive to be more quantitative regarding these effects, we can rank the diseases according to their importance and apply appropriate regulations to each disease depending on its importance. We can thus also prioritize the expenditure of our limited resources for fish health research.

Finally, as all of those in regulatory roles in government know, decisions must usually be made in the face of insufficient technical information. Even as we strive to shore up our technical information base, resource managers will be faced with this state of affairs. Thus, it is of utmost importance to recognize that one's philosophy toward animal transports will often determine the character of regulations and their implementations (as much or more so than supporting technical information). Therefore, it is incumbent on those of us in resource management to adopt a reasonable and workable philosophy on aquatic animal transports, recognizing the need for a stronger technical information base and for the education of all user groups, without unfairly targeting the aquaculture industry.



FISH HEALTH NEWSLETTER

The Fish Health Newsletter is a quarterly publication of the Fish Health Section of the American Fisheries Society. Submissions of any length on a topic of interest to fish health specialists are encouraged with the understanding that material is not peer reviewed and should be addressed to one of the editorial staff or to a member of the publication committee.

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FHS NEWSLETTER

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