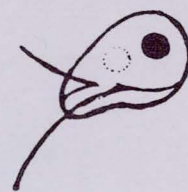


# FISH HEALTH SECTION

# A S F

# NEWS LETTER



Volume 13, Number 3

July, 1985

## REGISTRATION OF ROMET (Ro5-0037), A 15-YEAR EFFORT

*G.L. Bullock, R. L. Herman, U.S. Fish and Wildlife Service,  
National Fish Health Research Laboratory  
Kearneysville, West Virginia 25430*

*F.P. Meyer, U.S. Fish and Wildlife Service  
National Fishery Research Laboratory, LaCrosse, WI 54601*

The 26 November 1984 issue of *The Federal Register* contained an announcement by the U.S. Food and Drug Administration (FDA) that it has approved the use of Romet-30, an antibacterial drug for the control of furunculosis in salmonids. Romet-30 is the third therapeutic to receive FDA approval for control of disease in food fishes as a result of research by the U.S. Fish and Wildlife Service (FWS). Sulfamerazine was approved 12 December 1967 for control of furunculosis disease in trout. Oxytetracycline (Terramycin) received approval 23 September 1970 for control of furunculosis, bacterial hemorrhagic septicemia, and *Pseudomonas* infections in trout and catfish.

The FWS has continued its search for additional antibacterials for food fish use to control other diseases and because of possible development of drug resistant strains of bacteria. Hoffman-La Roche, Inc. of Nutley, New Jersey, suggested that Ro5-0037, a potentiated sulfonamide composed of sulfadimethoxine and ormetoprim might be a promising new drug for the control of furunculosis. This disease has continued to be a problem because the pathogen readily develops resistance to sulfamerazine and Terramycin. In August 1969, Dr. S.F. Snieszko, National Fish Health Research Laboratory (NFHRL), Leetown, West Virginia, signed an Investigator Form with Hoffmann-La Roche, Inc. and studies began.

Tests conducted at the NFHRL showed that Ro5-0037 at 50 mg/kg per day controlled experimental infections of furunculosis. This level is one-fourth the recommended rate of sulfonamerazine treatment. In vitro sensitivity studies showed that *Aeromonas salmonicida*, *Yersinia ruckeri*, *Vibrio anguillarum*, and *Flexibacter columnaris* were also sensitive to Ro5-0037. When fed to trout at 50 mg/kg per day for 14 days Ro5-0037 controlled natural furunculosis epizootics with no toxic effects on the fish. Tissue residue tests conducted by Hoffmann-La Roche, Inc. during the early 1970's demonstrated that there was no sulfadimethoxine residue in muscle or skin 2 weeks after the 14-day treatment, but that ormetoprim residues were present in skin for more than 2 months. The lingering ormetoprim residues meant that FDA would require up to 6 months withdrawal time before fish could be stocked or marketed. Studies on Ro5-0037 were terminated in 1974 because of the residue problem.

In 1977, Dr. Gianopaulo Maestroni, who was in charge of the Ro5-0037 studies at Hoffmann-La Roche, Inc. contacted G.L. Bullock (NFHRL) to inquire if a shorter treatment regimen would be effective and not cause the troublesome residue problem. A 5-day treatment period was tried with good success in controlling furunculosis. Residue studies showed that when ormetoprim was fed for only 5 days it disappeared from the skin in 5 weeks. As a result of these

studies, in 1978, the FDA issued an Investigational New Animal Drug Permit to allow the compound to be field tested. Field trials were conducted at several hatcheries across the United States. Results showed that the 5-day Ro5-0037 treatment effectively controlled furunculosis and enteric redmouth disease if treatment was started early in an epizootic and if fish were not subjected to other stresses.

In November 1980, after review of five volumes of data submitted in support of registration, FDA indicated that additional efficacy and environmental data would be needed. An efficacy test was requested to demonstrate that 75 mg/kg Ro5-0037 did not provide better control of furunculosis than the 50 mg/kg level. Another study determined levels of Ro5-0037 in the raceway water and sediment during and after the 5-day treatment. In addition to the FWS studies, Hoffmann-La Roche, Inc. provided additional data and statistical analyses on field and laboratory trials. All requirements for human health and safety, toxicity to fish, efficacy, and environmental assessments were eventually satisfied and final approval was given on 26 November 1984. This approval allows Ro5-0037 (marketed under the name of Romet-30) to be used in a 5-day treatment for the control of furunculosis in trout and salmon. Fish cannot be stocked or marketed until 6 weeks after treatment. Studies are now underway to register Romet-30 for the control of enteric redmouth disease and vibriosis in salmonids and *Edwardsiella ictaluri* infections in catfish.

The drug registration program of the Fish and Wildlife Service is a cooperative effort between the Service, private industry, and other governmental agencies. In the case of Romet-30, studies were also conducted by personnel at the National Fishery Research Laboratory, La Crosse, Wisconsin. That laboratory has the prime responsibility for coordinating the Service's efforts in chemical and drug registration. In addition to the National Fish Health Research Laboratory, Hoffman-La Roche, personnel of several state and federal hatcheries, and the Division of Fishery Research, Washington, D.C., participated in the total effort.

At present, other research related to FDA registrations is in progress on chloramine-T for control of bacterial gill disease, tiamulin for bacterial infections, and antifungal compounds. Some of these studies may be funded by the IR-4 Project--a cooperative project of the FDA, EPA, U.S. Department of Agriculture, state agricultural extension services, and by the manufacturers to help obtain registration for the use of drugs and chemicals for minor use species, such as fish.

## FHS OFFICERS AND COMMITTEES 1984-85

### EXECUTIVE COMMITTEE

#### Voting Members

Trevor Evelyn, Chairman and President, FHS  
 John Rohovec, President-Elect  
 Glenn Hoffman, Immediate Past President  
 Doug Anderson, Secretary-Treasurer  
 Diane Elliot, Chairman, Nominating Committee

#### Non-voting Members (Chairmen of Standing Committees)

John Rohovec, Newsletter and Publications Committee  
 Emmett Shotts, Awards Committee  
 Steve Leek, Membership and Ballotting Committee  
 Paul Janeke, Professional Standards Committee  
 Kevin Amos, Technical Procedures Committee

### STANDING COMMITTEES

#### Nominating

Diane Elliott, Chairman (elected)  
 John Schachte  
 John Grizzle

#### Newsletter and Publications

John Rohovec, Chairman  
 Dave Ransom  
 Jim Winton  
 Tom Wellborn  
 Jack Gratzek

#### Membership and Ballotting

Steve Leek, Chairman  
 Ray Brunson

#### Technical Procedures

Kevin Amos, Chairman  
 Emmett Shotts  
 Ray Brunson  
 Ken Johnson  
 Ellis Wyatt  
 Dave Groman, Ex Officio

#### Professional Standards

Paul Janeke, Chairman  
 Jim Carlisle  
 Doug Mitchum  
 John Cvitanich  
 Bev Larson

#### Finance

Doug Anderson, Chairman  
 Steve Leek (Membership)  
 John Rohovec (Newsletter)

#### Awards

Emmett Shotts, Chairman  
 Dennis Anderson (two years)  
 John Rohovec (three years)

### BOARD OF CERTIFICATION

(Elected)

Doug Mitchum, Chrm. (2 years)  
 Jim Warren (1 year)  
 Gary Camenisch (1 year)  
 Kevin Amos (2 years)  
 Joe Lientz (3 years)

### AD HOC COMMITTEES

(Appointed)

#### Archives

Joe Sullivan, Chairman  
 Roger Herman  
 John Grizzle

#### Bylaws

Jim Warren, Chairman  
 Fred Meyer

#### Directory

Rowan Gould

#### Fund Raising

Dave McDaniel, Chairman  
 Doug Anderson  
 Roger Herman

#### International Meeting (1986)

Chairman to be selected  
 Bill Rogers  
 Leo Margolis  
 Barry Hill  
 Dave Conroy

#### Program (1985 meeting)

Trevor Evelyn  
 Ron Goede

#### Time and Place (86-89)

John Fryer, Chairman  
 Charles Suppes  
 Bill Rogers

## HELP NEEDED FISH HEALTH INSPECTION AND CERTIFICATION PROCEDURES FOR BAITFISH

David Locke

Department of Inland Fisheries and Wildlife  
 Augusta, Maine 04333

Recently, the U.S. Court of Appeals for the First Circuit handed down a decision under the Lacey Act that a 25 year old State of Maine statute that bans the importation of live fish into the state to be used as bait fish violates the Commerce Clause of the U.S. Constitution. An attempt will be made to appeal this case to the U.S. Supreme Court. The intent of Maine's embargo upon fish used for live bait is two-fold: (1) to prevent the introduction of diseases and parasites and (2) to prevent the unintentional introduction of non-indigenous fish species and other aquatic life that may not be readily detected in a shipment of bait fish.

In the event that this case is refused or is upheld by the Supreme Court it will be necessary for Maine to develop a fish health inspection/certification procedure to minimize the risks of introducing serious fish pathogens via bait fish that could endanger native fish populations. Maine's existing fish importation law requires a "point of origin" inspection and certification and is directed toward salmonid pathogens. Even the procedures outlined in the AFS Fish Health Section, "Blue Book" are primarily directed toward salmonid pathogens. I would therefore solicit suggestions from members of the Fish Health Section on developing criteria for fish health inspections/certifications of bait fish farms.

First, it may not even be practical to do fish health inspections of some bait fish farms because of their immense size, numerous water supplies containing wild fish and the frequent transfers of fish between fish farms. Possibly sampling procedures should be somewhat different than have been devised for the "Blue Book". A sampling protocol that strictly follows the definition of an individual lot could mean that a tremendous number of fish samples would have to be examined at some fish farms.

Another area of concern would be to define just which pathogens are significant and should be inspected for. Many parasites and diseases that are considered to be ubiquitous in many bait fish producing areas are unknown in Maine and could have significant impacts upon native fish populations. An example of this became evident a couple of years ago, when the National Fish Health Laboratory at Leetown was seeking golden shiners free of GSV in order to establish new cell line stocks and was unable to obtain uncontaminated golden shiners until they contacted us in Maine.

The Asian tapeworm, *Bothriocephalus acheilognathi* or *opsalichthydis* introduced into the United States with the grass carp has been reported from many bait fish farms in the southeastern states. This large parasite has caused serious mortalities in small golden shiners in fish farms where it occurs. We are concerned, that should this parasite become established in Maine waters, it could be devastating to native forage species, particularly the rainbow smelt which is the mainstay of our famous landlocked salmon fisheries.

There is at least one documented case where two important bacterial pathogens (ERM and furunculosis) were transferred with a bait fish shipment into a western state. Consequently it may be necessary to conduct fish health inspections of bait fish farms for a wide spectrum of fish pathogens.

The detection procedures for asymptomatic infections of many bait fish diseases and parasites have not been refined to the extent that they have for salmonid pathogens. If any members of the Fish Health Section have suggestions for detection techniques that should be followed when doing inspections of bait fish farms, it would be much appreciated. I would also like suggestions for sampling techniques and opinions on pathogens that should be included on a list for certification, keeping in mind that Maine is relatively free of diseases and parasites that are common in many bait fish producing areas.

**September 8-12, 1985. Fish Immunology Sandy Hook (FISH).** This international meeting will be held at the Northeast Fisheries Center at Sandy Hook, NJ. For further information contact Dr. Joanne Stolen, NEFC, Sandy Hook Laboratory, Highlands, NJ 07732.

A copy of **Cancerous Diseases in Aquatic Animals and Their Association with Environmental Pollutants: A Critical Review of the Literature** has been received at AFS. The report, prepared by Michael Mix of Oregon State University, has undergone critical peer review in the U.S. by several eminent scientists working exclusively in the field. It was also extensively reviewed by the American Petroleum Institute Cancer in Fish Task Force which provided AFS a copy. If there is interest in the 250-page report, we will make our copy available through the AFS Fish Health Section.

# **PLANNED PROGRAM FOR THE JOINT FISH HEALTH SECTION/ AMERICAN FISHERIES SOCIETY — WESTERN FISH DISEASE GROUP WORKSHOP**

## **MONDAY, JULY 29**

6:00-8:00 p.m. REGISTRATION

## **TUESDAY, JULY 30**

|            |                                                                                                                                                                                                                                                                                                               |            |                                                                                                                                                          |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7:30 a.m.  | REGISTRATION                                                                                                                                                                                                                                                                                                  | 11:30 a.m. | Biochemical comparison of four reoviruses isolated from aquatic animals. J.R. Winton, C.N. Lannan, J.L. Fryer, R.P. Hedrick, T.R. Meyers and J.A. Plumb. |
| 8:30 a.m.  | WELCOME & ANNOUNCEMENTS (T.P.T. Evelyn and K. Amos)                                                                                                                                                                                                                                                           | 11:45 a.m. | Morphological and cultural characteristics of reoviruses isolated from aquatic animals. T. Yamamoto.                                                     |
|            | INVITED PAPERS ON IHN<br>(Chairman: W.J. Groberg, Jr.)                                                                                                                                                                                                                                                        | 12:00 p.m. | LUNCH                                                                                                                                                    |
| 8:45 a.m.  | Potential for horizontal and vertical transmission of infectious hematopoietic necrosis virus. R. Watanabe and J.S. Rohovec.                                                                                                                                                                                  |            | INVITED PAPERS ON BKD<br>(Chairman: T. Evelyn)                                                                                                           |
| 9:00 a.m.  | Delayed appearance of IHNV in stored salmon ova. S.E. LaPatra, W.J. Groberg, J.S. Rohovec, and J.L. Fryer.                                                                                                                                                                                                    | 1:30 p.m.  | Bacterial kidney disease contribute to ocean mortality. C.R. Banner and J.S. Rohovec.                                                                    |
| 9:15 a.m.  | Immunization of salmonid fishes to infectious hematopoietic necrosis virus (IHNV). J.C. Leong, H.M. Engelking, J.F. Koehler, R. Gilmore, G. Kurath, and C. Passavant                                                                                                                                          | 1:45 p.m.  | Effectiveness of feeding erythromycin thiocynate to control bacterial kidney disease in juvenile Pacific salmon. M. DeCew.                               |
| 9:30 a.m.  | Relative resistance of diploid and triploid rainbow trout ( <i>Salmo gairdneri</i> ), and coho salmon ( <i>Oncorhynchus kisutch</i> ), and their reciprocal hybrids to laboratory challenge with infectious hematopoietic necrosis (IHNV) virus. R.A. Busch, J.E. Parsons, G.H. Thorgaard, and P.S. Scheerer. | 2:00 p.m.  | Prospects for a bacterial kidney disease (BKD) vaccine. S. Kaattari.                                                                                     |
| 9:45 a.m.  | Hatchery management strategies for control of infectious hematopoietic necrosis. W.J. Groberg, Jr.                                                                                                                                                                                                            | 2:15 p.m.  | Quantitation of <i>Renibacterium salmoninarum</i> in ovarian fluid by a membrane filtration - fluorescent antibody procedure. D.G. Elliott.              |
| 10:00 a.m. | DISCUSSION                                                                                                                                                                                                                                                                                                    | 2:30 p.m.  | Bacterial kidney disease: a method for preventing its vertical transmission. T.P.T. Evelyn.                                                              |
| 10:15 a.m. | BREAK                                                                                                                                                                                                                                                                                                         | 2:45 p.m.  | DISCUSSION                                                                                                                                               |
|            | CONTRIBUTED PAPERS<br>(Chairman: T. Yamamoto)                                                                                                                                                                                                                                                                 | 3:30 p.m.  | BREAK                                                                                                                                                    |
| 10:30 a.m. | Size and susceptibility of two salmonid species to two strains of infectious hematopoietic necrosis virus. S.E. LaPatra, W.J. Groberg, Jr., J.S. Rohovec, and J.L. Fryer.                                                                                                                                     |            | CONTRIBUTED PAPERS<br>(Chairman: G.W. Klontz)                                                                                                            |
| 10:45 a.m. | Processes leading to IPN lethality of rainbow trout fry. N. Okamoto and T. Sano.                                                                                                                                                                                                                              | 3:15 p.m.  | Development and uses of an ELISA for <i>Renibacterium salmoninarum</i> . R. Pascho.                                                                      |
| 11:00 a.m. | Experimental induction of the carrier state in brook trout: a model challenge protocol for IPNV immunization. L.M. Bootland, R.M.W. Stevenson, and P. Dobos.                                                                                                                                                  | 3:30 p.m.  | Production of monoclonal antibodies against <i>Renibacterium salmoninarum</i> . C.K. Arakawa, J.E. Sanders, and J.L. Fryer.                              |
| 11:15 a.m. | Trout serum neutralization of aquatic birnaviruses. R.K. Kelly and O. Nielsen.                                                                                                                                                                                                                                | 3:45 p.m.  | What is proliferative kidney disease? G.W. Klontz.                                                                                                       |
|            |                                                                                                                                                                                                                                                                                                               | 4:00 p.m.  | Proliferative kidney disease (PKD): Epidemiological studies in hatchery-reared salmonids in California, U.S.A. J.S. Foott and R.P. Hedrick.              |
|            |                                                                                                                                                                                                                                                                                                               | 4:15 p.m.  | Affinities of PKX, the causative agent of proliferative kidney disease with the phylum Myxozoa. M.L. Kent and R.P. Hedrick.                              |
|            |                                                                                                                                                                                                                                                                                                               | 4:30 p.m.  | FHS EXECUTIVE COMMITTEE MEETINGS<br>(Voting and non-voting members only).                                                                                |

## WEDNESDAY, JULY 31

### INVITED PAPERS ON FISH HEALTH ASSESSMENT (Chairman: R.W. Goede)

- 8:00 a.m. Assessing the impacts of diseases on fish populations: the problems and methods of monitoring. G. Wedemeyer.
- 8:20 a.m. Stress physiology and its application in fish health management. B.A. Barton and C.B. Schreck.
- 8:40 a.m. Necropsy-based fish health assessment. R.W. Goede.
- 9:00 a.m. DISCUSSION

### CONTRIBUTED PAPERS (Chairman: C.E. Smith)

- 9:15 a.m. Studies on dropout disease of spring chinook salmon. C.E. Smith and G. Ketola.
- 9:30 a.m. A "soft-shell" condition in fall chinook salmon eggs. J. Morrison and S. Leek.
- 9:45 a.m. Studies on chinook salmon rosette agent. R. Elston and L. Harrell.
- 10:00 a.m. Ecology and possible causes of the jellied condition in Dover sole (*Microstomus pacificus*). H.M. Puckett and G.L. Hendrickson.
- 10:15 a.m. BREAK

### CONTRIBUTED PAPERS (Chairman: S.G. Newman)

- 10:30 a.m. Epizootiologic aspects of fin rot disease in Atlantic salmon. S. Maheshkumar, D.B. Pratt, and P.W. Reno.
- 10:45 a.m. Comparison of *Flexibacter columnaris* strains isolated from North America and other countries of the Pacific Rim. Yen-Ling Song.
- 11:00 a.m. Characterization of *Yersinia ruckeri* isolates. R.M.W. Stevenson, S.A. DeGrandis and D.E. Flett.
- 11:15 a.m. Infectious disease studies at Manchester Marine Experimental Station. L. Harrell.
- 11:30 a.m. Direct immersion vaccination of juvenile rainbow trout, *Salmo gairdneri*, and juvenile coho salmon, *Oncorhynchus kisutch*, with a *Yersinia ruckeri* bacterin at high dilutions. S.G. Newman.

- 11:45 p.m. Progress in the development of furunculosis vaccines. W.D. Paterson, P. Greer, D. Airdrie, M. Poy and G.J. Greenham.

12:00 p.m. LUNCH

### INVITED PAPERS ON DIAGNOSTIC APPROACHES TO NON-INFECTIOUS FISH HEALTH PROBLEMS (Chairman: R.W. Goede)

- 1:30 p.m. Non-infectious disease: A difference in perception — Let's not reinvent the wheel! G. Johnson.
- 1:50 p.m. Non-infectious diseases: the importance of histopathology in their diagnosis. C.E. Smith.
- 2:10 p.m. Histopathology lab — The lab of last resort? W.T. Yasutake
- 2:30 p.m. Cytogenic tools for the study of environmentally mediated injury. M. Landolt and R. Kocan.
- 2:45 p.m. DISCUSSION
- 3:00 p.m. BREAK

### CONTRIBUTED PAPERS (Chairman: J.S. Rohovec)

- 3:15 p.m. Adenovirus-like particles associated with a disease of cultured white sturgeon, *Acipenser transmontanus*. R.P. Hedrick, J. Speas, M.L. Kent and T. McDowell.
- 3:30 p.m. Isolation and characterization of a new virus from chinook salmon in Oregon. C.N. Lannan, J.R. Winton, and J.L. Fryer.
- 3:45 p.m. A new viral etiology of anemias in salmonids. J.S. Rohovec, R.A. Holt, D.A. Hursh, S.L. Leek, and J.R. Winton.
- 4:00 p.m. FHS BUSINESS MEETING: All FHS members are encouraged to attend.
- 6:00 p.m. COCKTAIL HOUR: Courtesy of John Majnarich, Biomed Research Laboratories.
- 7:00 p.m. BANQUET. Master of Ceremonies. T.P.T. Evelyn, FHS President.
- AFTER DINNER SPEAKER: Dr. Leo Margolis, Head, Fish Health and Parasitology Section, Pacific Biological Station, Nanaimo, B.C.

## THURSDAY, AUGUST 1

- 8:00 a.m. OPEN DISCUSSION ON CURRENT FISH HEALTH PROBLEMS (Chairman: K. Amos)
- 10:15 a.m. BREAK
- 10:30 a.m. OPEN DISCUSSION ON CURRENT FISH HEALTH PROBLEMS (Continued)  
(Chairman: K. Amos)

- 11:45 a.m. CLOSING OF WORKSHOP AND SELECTION OF THE SITE FOR THE 1986 WESTERN FISH DISEASE WORKSHOP
- 12:00 p.m. LUNCH

## FHS COMMITTEE REPORTS

### PROFESSIONAL STANDARDS COMMITTEE

The Fish Health Inspector certification program underwent considerable revision. It was written in the same format as the Fish Pathologist program making objectives, qualifications, definitions and procedures more easily understood. As of April 29, 1985, there were 27 certified Fish Health Inspectors.

Procedures for Revocation and Censure - Fish Health Inspector, Fish Pathologist Certifications was approved by the Excom and is in effect. This document describes the procedures, time frames and responsibilities whereby the Board of Certification investigates charges of immoral, illegal and/or dishonest actions or gross incompetence on the part of a certified FHI or FP.

The grandfathering period for the Fish Pathologist certification program ended as of January 1, 1985. Forty-seven individuals were certified during the initial three years of the program. All successful applicants applying after January 1, 1985, must pass a written examination. Examination questions have been solicited from fish health specialists worldwide. Response to this solicitation has been very poor. The Examination Review Board has been formed to review and edit questions received. Members are John Fryer (Chairman), Dennis Anderson, Trevor Evelyn, John Plumb, John Rohovec and Bill Rogers. We will begin a new push for exam questions in the near future. Your help will be very much appreciated.

Submitted by  
Paul W. Janeke, chairman

### AWARDS COMMITTEE

Nominations for the S.F. Snieszko Distinguished Service Award were solicited early this term. Several outstanding fish scientists were considered and two were chosen this year to receive the coveted award. Many recommendation letters were received from worldwide fish health experts in support of the awardees. Awards will be officially given at the Fish Health Section meeting held in Seattle later this month.

Submitted by  
Emmett Shotts, chairman

### TECHNICAL PROCEDURES COMMITTEE

"Nothing worth having comes easy." I hope this statement accurately represents the attitude of the Fish Health Section. As stated in previous reports, the main (and only) focus on our committee has been on the completion of the Blue Book. Though I've always been optimistic about completion dates, the realities of the situation have meant delays. Highlights of the project have been the receipt of all the material from contributors and incorporation into a rough draft. Copies of the draft have been sent for final review to Dr. Leo Margolis, the Leetown staff, and the Technical Procedures Committee. I have received Dr. Margolis' comments and anxiously await the others. The work that remains is final editing and printing. I will not promise a completion date, but it will be as soon as possible. The committee would like to thank all the authors and reviewers for their effort.

Submitted by  
Kevin Amos, chairman

### DIRECTORY COMMITTEE

A Fish Health Section membership directory is on line in a computer file. The booklet, which is to be published later this year, will serve the fish health community as copies will be sent to each member of the Section. A survey was taken so that telephone numbers could be included as part of the directory. This useful information will be available for the members who responded. Also included as part of the directory will be the current by-laws of our Section.

Submitted by  
Rowan Gould, chairman

### FINANCE COMMITTEE

The FHS carries two accounts: the General Fund, presently holding \$3880.87, and the Certification Account having \$2492.78. The funds are held in The Bank of Charles Town (WV) in a Super N.O.W. account. Last year the Glossary Account of \$193.87 was inactivated and united with the General Fund by a vote of the Executive Committee in July 1984. Annual dues are paid by our members to the parent society (AFS), then portioned to our accounts quarterly.

The AFS Permanent Home Fund was given \$100.00 last year from our accounts as was \$75.00 to the Sandy Hook New Jersey Fish Immunology Symposium and \$100.00 to the AFS Skinner Memorial Travel Fund. The FHS Newsletter continues to be the largest expense averaging about \$550.00 per issue. The increase in the amount in the Certification account is a result of the registration of over 75 new Fish Health Inspectors and Fish Pathologists.

Submitted by  
Doug Anderson, chairman

### TIME AND PLACE COMMITTEE

The 1985 Fish Health Section Workshop will be held in Seattle, Washington with hosts Trevor Evelyn and Kevin Amos; the 1986 Fish Health Workshop will be in Leetown, hosted by Pete Bullock; and the 1987 Fish Health Section Workshop and International Meeting is proposed to be held at Vancouver, B.C. with Trevor Evelyn as host.

Submitted by  
John Fryer, chairman

### MEMBERSHIP AND BALLOTING COMMITTEE

Members of the Fish Health Section represent twenty countries to include Australia, Austria, Brazil, Canada, Chile, England, Finland, France, Israel, Ivory Coast, Japan, Korea, Kuwait, Mexico, Norway, Peru, Scotland, Spain, West Germany, and the United States. We currently have 428 members, 66 of whom reside outside of the USA. You are encouraged to solicit new members for the Section.

The ballots for the 1985 election will be in the mail very soon. Included with the ballots will be your membership card, profiles of the candidates, and of course a ballot for elected positions for 1985-86. We encourage everyone to participate in the election and request that you return the ballots by August 1, 1985.

Submitted by  
Steve Leek, chairman

### NOMINATING COMMITTEE

The FHS Nominating Committee has selected the following consenting FHS members as candidates for office in the 1985 elections.

|                                                |                                                          |
|------------------------------------------------|----------------------------------------------------------|
| For the office of President-Elect:             | 1) Ron Hedrick<br>2) Wilmer Rogers                       |
| For the office of Secretary/Treasurer          | 1) Doug Anderson<br>2) Roger Herman                      |
| For the Board of Certification (two positions) | 1) Marshall Bealeu<br>2) Paul Bowser<br>3) Tom Schwedler |
| For Chairman of the Nominating Committee:      | 1) John Grizzle<br>2) John Schachte                      |

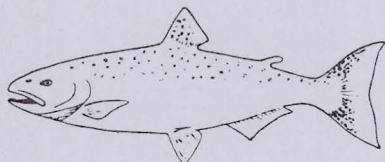
I believe that we have a good slate of candidates who will work hard for the FHS. My committee members, John Grizzle and John Schachte, did a fine job of selecting and contacting many of the candidates.

Submitted by  
Diane G. Elliott, chairman

## DELAYING INITIATION OF FEEDING CONTROLS VISCERAL MYCOSIS

Steve Roberts, Fish Pathologist  
Washington Dept. of Game  
1421 Anne Ave., East Wenatchee, WA 98801

Experiments were conducted at two hatcheries testing delaying initiation of feeding in rainbow swimup fry in efforts to control visceral mycosis. Visceral mycosis is an internal *Saprolegnia* sp. infection that causes a 5-20% mortality in newly feeding rainbow swimup fry. Duplicate groups of fish were first fed at 0,3,7,11, and 15 days following first observations of swimming to the surface. Delaying initial feeding to 7,11, and 15 days post swimup markedly reduced visceral mycosis mortality. Fish size was only smaller in the group delayed 15 days post swimup. Water temperature for the experiments was 50°F. Recommendations on the timing of initiation of feeding for swimup rainbow fry to control visceral mycosis based on water temperature were generated. Feeding should be started at 170 temperature units after swimup was first observed.



## ISOPODS INFEST CHILEAN SALMON

Ximena Reyes  
School of Marine Science  
Catholic University of Valparaíso, Chile

*Ceratothoa* (=Meinertia) *gaudichaudii*, a cymothoid isopod has repeatedly caused problems at several net pen facilities rearing coho salmon in Chile. Usually 2-3 specimens of various sizes (0.5-1.5 cm) and stages of development are found in the mouth of the fish. While mortalities cannot be directly attributed to the parasite, salmon don't feed as well. In a given pen, as much as 90% of the fish can be infected. Often, caligid copepods occur jointly.

*C. gaudichaudii* occurs from southern California to the Magellanic region in a number of fishes. Like other cymothoids it is a protandric hermaphrodite and the juveniles are pelagic. So far no females have been found on the salmon.

Use of 0.25-1.0 ppm Neguvon while moderately effective on the young does not remove advanced juveniles.

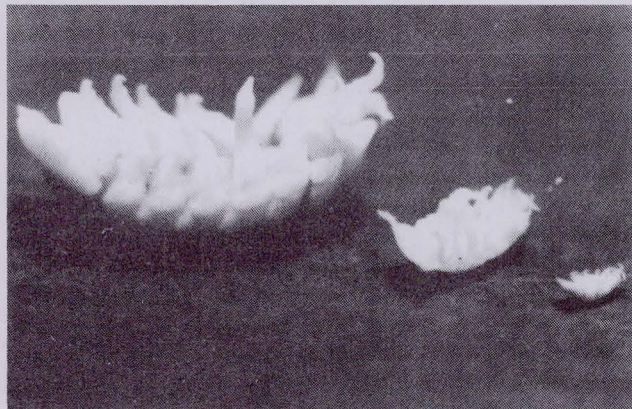


Figure 1. Adult (left) and two juvenile male isopods from coho salmon.

## IHN OUTBREAK IN LAKE COWICHAN, BRITISH COLUMBIA

Garth Traxler  
Department of Fisheries and Oceans  
Fisheries Research Branch, Pacific Biological Station  
Nanaimo, B.C., Canada

An outbreak of IHN in a natural population of kokanee (non-anadromous *Oncorhynchus nerka*) occurred in Lake Cowichan on Vancouver Island. In spite of heavy bird predation, dead and dying kokanee were observed at the surface of the lake over at least a 2-week period in early May 1985. Surface water temperatures during this period were 11.5-12°C. The mortalities were confined to 2-year-old kokanee still more than a year from maturity. The cause of the outbreak is not known, but this is the first reported fish mortality in Lake Cowichan since IHN virus was first recorded there in dying kokanee in 1973. Records show these fish were also 2 years old. The occurrence of IHN in 2-year-old kokanee is in contrast to the occurrence of this disease in sockeye salmon (anadromous *O. nerka*), where IHN usually occurs at the extremes of the life cycle of the fish, and the sensitive smolting state.

IHN virus titers in the kidneys of 14 sampled kokanee ranged from  $9.00 \times 10^5$ - $1.0 \times 10^9$  per gram of tissue. Plaque assays of gill samples were done only on moribund fish. All three gills tested were positive, with virus titers ranging from  $2.50$ - $5.45 \times 10^7$  per gram of tissue. Typical IHN pathology was observed in histological sections of kidney and pancreas. No bacterial pathogens were detected by examination of Gram stained kidney smears or by plating kidneys on TSA or KDM-2.

Is anybody out there?  
Pink Floyd  
The Wall

## NEW HOST FOR BRANCHIOMYCES SANGUINIS

Rodney Horner  
Illinois Department of Conservation  
Sand Ridge Fish Hatchery Box 398  
Manito, IL 61546

Walleye pike (*Stizostedion vitreum*) were found to be infected with *Branchiomyces sanguinis*. This observation represents an extension of the host range for this fungal pathogen. A population of approximately 20,000 walleye pike with an individual size of two inches were experiencing a 1-1.5% mortality per day. The infected fish had very distinctive gill pathology and when gill wet mounts were examined microscopically, the fungus was clearly obvious. Branching, non-septate hyphae grew in capillaries and arteries and there were what appeared to be multiple strings of pearls. Glenn Hoffman, Parasitologist for the US Fish and Wildlife Service in Stuttgart, Arkansas confirmed the diagnosis with material preserved in 10% buffered formalin.

The fish involved in this epizootic were being held in 11,000 gallon start tanks which were supplied with water from a 22 acre holding pond which received well water. Water was stored in the holding pond in an effort to increase water temperature. Before this water is used for fish rearing it is sand-filtered and treated with UV light. However, prior to and during the epizootic, this system was not operable. In addition, water quality in the tanks was poor because of a heavy organic load resulting from excessive feeding. The disease was controlled with 0.1 ppm malachite green for 12 hours and by improvement of environmental conditions. These improvements included increasing the water flow, decreasing temperature from 75 to 68°F, and decreasing the amount fed.

## SEARCH FOR FUNGICIDE TO REPLACE MALACHITE GREEN

Tom A. Bailey and Leif L. Marking, National Fishery Research Laboratory, P.O. Box 818, LaCrosse, WI 54602-0818

Nearly 100 chemicals have been screened for their *in vitro* antifungal activity. Among them were two commercial products that are advertised for controlling aquatic fungi. Small Fish Saver® and Catch and Release® failed to control the growth of test fungi at recommended rates and also at concentrations 100 times higher. The components in these preparations were methylene blue, nalidixic acid, 5-nitrosalicylic acid, potassium chloride, and sodium chloride; individually these components also demonstrated little or no antifungal activity.

Six compounds have been identified as promising candidate fungicides. Using the antifungal spectrum index, the compounds were ranked in decreasing order of antifungal activity: malachite green (23.4) 8-Quinololinol (23.0) Polyphase 17 WD (20.0) Polyphase (18.0) Busan 30 (16.0) AO (12.8) Defungit (4.0). The MIC's for 8-Quinololinol were 1.0 and 10.0 mg/L for the two exposure periods and for both species of fungus. This oxyquinoline compound is used as a fungistat and disinfectant and its activity is apparently neither time nor species dependent. Polyphase and Polyphase 17WD are carbamate fungicides that were effective in the range of 1.0 to 5.0 mg/L. A longer contact time (60 minutes) provided greater effectiveness against the fungi. Busan 30, a benzothiazole, was developed for use as a general microbicide. MIC levels range from 3 to 5 mg/L. AO is an experimental fungicide that was inhibitory to *A. flagellata* at 15.0 mg/L in 15- and 60-minute exposures, and to *S. hypogyna* after 60 minutes. *S. hypogyna* growth was controlled with 50 mg/L after 60 minutes of exposure to AO. The MIC for Defungit ranged from 100 to 750 for the 15- and 60-minute exposures.

To be an effective replacement for malachite green, a candidate compound should be as effective against aquatic fungi as malachite green, be soluble in water, safe to nontarget organisms, readily available, and economical enough for culturists to afford. To date, we have found no candidate fungicide that meets these criteria. Defungit is the only one of the six candidates that is water soluble, but it is not as effective as the others. Final evaluations of these compounds will involve results of exposures of infected eggs and fish, exposures of nontarget organisms, and the development of therapeutic indices.

## PASSAGES

Dr. Jim S. Nelson has taken employment with Aqua Health Ltd. of Toronto, Canada. His new address is 1755 Steeles Ave. West, Willowdale, Ontario, Canada M2R 3T4. His phone number is (416) 667-2678.

## POSITION ANNOUNCEMENT

Biologist III (Fish Pathologist), Maine Department of Inland Fisheries and Wildlife, Augusta, Maine. Salary ranges from \$22,610 to \$31,013. Some of the duties include diagnostic investigations of fish health problems and supervising fish health management programs at nine State fish hatcheries; comprehensive fish health inspections of these hatcheries on a periodic basis according to AFS/FHS procedures of Canadian Fish Health Protection Regulations; evaluate the fish health status of each lot of fish at the nine state fish hatcheries prior to each biennial fish stocking season; identification of fish parasites on specimens brought to the laboratory by fish biologists, enforcement personnel or members of the public; conduct applied research studies for the control of fish diseases, nutritional or physical-chemical disorders in hatchery fish; and serve as a fish health certification agent for state, federal and international importation laws. Applicants should be certified or else eligible for certification by the AFS/FHS as a fish pathologist or fish health inspector shortly after employment. Qualified applicants should contact David O. Locke, Maine Department of Inland Fisheries & Wildlife, 284 State St., Station #41, Augusta, Maine 04333 immediately by telephone at (207) 289-3651 for application forms and details. The position will be filled within a few weeks.

## BRIEF REPORTS

A significant level of mortality occurred recently in smolting coho at the Cowlitz Salmon Hatchery. The loss was attributed to BKD, low-temperature disease and external fungus. Further investigation, however, unmasked the "real" culprit - VEN. Besides the typical anemia with immature erythrocytes, we also observed both types of inclusion bodies. As seen in other cases, VEN seems to be very important in predisposing fish to infection of other pathogens. Kevin Amos and Mark DeCew, Washington Department of Fisheries, 115 General Administration Bldg., Olympia, WA 98504.

★★★★★

The National Fishery Research Laboratory at LaCrosse, Wisconsin, has prepared a Research Information Bulletin (RIB) on problems caused by the use of unregistered fishery compounds. The item also includes a comprehensive listing of chemicals that are legal to use and where they can be obtained. For more information contact Rosalie A. Schnick, LaCrosse National Fishery Research Laboratory, P.O. Box 818, LaCrosse, WI 54602.

★★★★★

Dr. Glenn Hoffman, past president of the Fish Health Section, recently received the Distinguished Service Award from the Fish Culture Section of the AFS. This honor is the highest award which is given by the Section. As a recipient of this award Dr. Hoffman will automatically be inducted into Fish Culture Hall of Fame at the D.C. Booth Historic Fish Museum at Spearfish, S.D. We are sure that all members of the Fish Health Section join in congratulations to Glenn.

★★★★★

A workshop on proliferative kidney disease (PKD) was hosted by the University of California at Davis. Administrators and fish pathologists from British Columbia, Washington, Oregon, Idaho, Nevada and California met on April 25-26 in Davis to discuss management strategies for controlling the spread of PKD. The early portion of the workshop was spent in reviewing what is currently known about the disease. The second day focused on management options. A summary of the workshop is available from Ron Hedrick, School of Medicine, Dept. of Veterinary Medicine, Univ. California at Davis, Davis, CA 95616.

★★★★★

Chile has recently implemented a new fish disease control law. The law is designed to prevent the introduction of salmonid diseases and to control the spread of those already present. The law is similar to those of several states in the USA. It lists three categories of diseases with Class 1 being the most serious. In this class are included: VHS, IPN, IHN, OMV, BKD, and whirling disease. Import of live salmonids is limited to eggs and sperm of fish which certified free of these diseases and stocks within the country found to be infected with Class 1 diseases are to be destroyed.

## FROM THE EDITORS

In recent months the editors have been receiving fewer submissions from the members of the Section. We would like to encourage you to take a minute and send us a brief statement or summary of your recent work. We have worked hard to edit and produce the material that you send, but unless we receive something from you we are out of a job.

Included in this issue is the preliminary program for the FHS/WFDW meeting in Seattle. Trevor Evelyn and Kevin Amos have done an outstanding job in putting together an excellent group of papers. The format for the Western Fish Disease Conference (Thursday) will be the traditional open discussion with emphasis on problems or data that pathologists have encountered during the past year. People are encouraged to bring their photos and observations to share with the group. There is still space available for poster presentations and those wishing to add a poster are encouraged to contact Kevin Amos, Washington Department of Fisheries, 115 General Administration Building, Olympia, WA 98504. Phone 206-754-2825. If you are planning to attend the banquet and have not notified Kevin, please do so as soon as possible.

## 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 and should be addressed to one of the editorial staff or to a member of the publication committee.

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