FISH HEALTH SECTION

AFS

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JOINT MEETING OF THE FISH HEALTH SECTION AND THE EASTERN FISH HEALTH WORKSHOP

The joint meeting of the Fish Health Section and the Eastern Fish Disease workshop was held in Annapolis, Maryland on July 17-20, 1989. The conference which was held at the Ramada Inn, was hosted by the Maryland Department of Natural Resources, the National Fish Health Research Laboratory-Leetown and the Department of Microbiology, University of Maryland. Dr. Frank Hetrick of the University of Maryland coordinated the meeting's activities and arranged a program which included 67 scientific papers and almost 25 posters. The meeting was attended by approximately 180 participants, several of whom do not reside in North America.

In addition to the scientific sessions, the attendees were treated to a Maryland crab feed on the shores of Chesapeake Bay. At the annual banquet, John Plumb of Auburn University entertained the crowd with the after dinner speech which included a view of the catfish industry in the United States. The S.F. Snieszko Distinguished Service Award was presented to Doug Anderson for his numerous contributions to our profession.

Next year's Eastern Fish Health Workshop will be held at the Atlantic Veterinary College on Prince Edward Island, Canada. Dave Groman will be the host of the meeting held on June 17-19, 1990. The Fish Health Section will hold its 14th Annual Meeting in Minneapolis, Minnesota on July 17-19, 1990. The organizers and hosts of that meeting are Joe Marcino, Charlie Suppes, and Rod Horner.

WESTERN FISH DISEASE WORKSHOP

The 30th Annual Western Fish Disease Workshop was held at the Rosario Island Resort and Spa on Orcas Island in the San Juan Archipelego of Washington State. The Workshop commenced on June 21, 1989 and ended on the 23rd. The program began with a keynore address by Rosalie Schnick of the USFWS, LaCrosse, Wisconsin laboratory. Her topic was the registration of drugs and chemicals for use in fisheries. Following her address 27 papers were presented. Wayne Brunson of the Washington Department of Wildlife hosted the meeting and arranged the social activities which included a Northwest clambake and a prime rib banquet. Next year's meeting will be hosted by Keith Johnson and the Idaho Department of Fish and Game.

Randy McMillan
New editor 1990

TWO QUINOLONE ANTIBACTERIALS EFFECTIVE AGAINST FISH PATHOGENS

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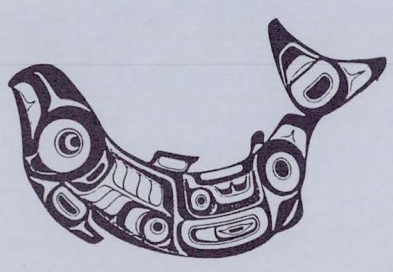
Oxolinic acid, a member of a group of antibacterials known as quinolones, has been reported to be effective against a wide variety of Gram-negative fish pathogens. Previously, we confirmed that low levels of oxolinic acid inhibited the growth of the major Gram-negative pathogens of fishes. However, rapid development of resistance to oxolinic acid has been reported, so we conducted laboratory tests to determine how rapidly the fish pathogenic bacteria would develop resistance to this antibacterial. We also tested a second quinolone, Sarafloxacin (A-56630), for in-vitro efficacy.

Develoment of resistance among test bacteria was measured by an increase in the minimum inhibitory concentrations. The minimum inhibitory concentration was first determined for several strains of the following pathogens: *Aeromonas salmonicida; A. hydrophila; Yersinia ruckeri; Edwardsiella tarda; and E. ictaluri.* Once this was established for each bacterial strain, that strain was grown in media containing one-fourth the minimum inhibitory concentration. After being transferred 30 times, the minimum inhibitory concentration for each strain was again determined and compared to the original. We found that many strains of bacteria did develop up to a 16-fold increase in resistance. However, even this large increase only resulted in resistance levels of 0.25 ppm, well below the 1 ppm reported to be found in fish muscle 3 days after an oral treatment.

The National Fisheries Research Center-La Crosse sent us a sample of A-56620 for determination of in-vitro sensitivity of the Gram-negative pathogens. The minimum inhibitory concentrations of 29 strains of the pathogens listed above were determined as previously described. The test strains generally proved to be more sensitive to A-56620 than to oxolinic acid. Five of the strains had identical minimum inhibitory concentrations to both compounds, while 24 had concentrations to A-56620 that were from one-half to one-fourth those of oxolinic acid.

Although A-56620 proved to be slightly more effective in inhibiting the fish pathogenic bacteria, both quinolones are effective compounds. However, at present oxolinic acid has no commercial sponsor and this is a requirement for Food and Drug Administration registration of any antibacterial compound. Therefore, future efforts will be toward obtaining data for Food and Drug administration registration of A-56620 which has the sponsorship of Abbott Laboratories.



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TO THE EDITORS:

In my opinion, the editorial on the front of the recent edition of the Newsletter (Vol. 17, Number 2), lacked professionalism, contained apparent elements of appeasement to private aquaculture, exhibited a lack of understanding of the significance of the VHS episode to private industry in Washington) by the way in which the whole episode was professionals on an issue where, I believe, there are some widely divergent opinions.

You state . . . "the isolation of an emergency disease" . . . As I'm sure you know, diseases are not isolated, only microbes are, and to the best of my knowledge, we have not seen any diseased or dead fish in this episode, only a virus (except in the high dose injection of the virus in the laboratory). This is a crucially important point, not only in terms of the science involved, but in terms of the public perception of the problem. Information which is not precise at the technical level becomes further distorted in the public media.

You state that the private industry has been "exceptionally cooperative". Exception in comparison to what, I would ask. I think they were cooperative, but also extremely angered (at least the salmon farming industry in Washington) by the way in which the whole episode was handled. Certainly, there has been an economic impact of VHS on the salmon industry in Washington. This impact has been solely a result of erroneous and exaggerated media reports on VHS which had a depressive effect on farmed salmon sales. The view in the salmon industry, which I tend to agree with, is that the economic impact of the disease resulting from such erroneous press coverage will be far greater than any direct effects of the virus on fish health.

I cannot offer my support to your call for the eradication of the virus at any cost. I think the detection of VHS calls for some extraordinary steps because of the potential risk. Nonetheless, the significance of the virus in Washington remains unknown, with some strong indications that it may not have the devastating effect that some predict and with some evidence that it is geographically widespread.

In general, I think the public interest is going to be best served by providing accurate and reasonably conservative technical information and interpretations, and presenting information which does not add to the alarmist response and hysteria which such an episode invariably tends to cause.

Ralph Elston
Senior Research Scientist
Battelle Marine Sciences Laboratory, Sequim, WA

FROM THE EDITORS,

Due to the potentially devastating impact of VHS virus upon stocks of salmon and trout in North America, we stand by our editorial opinion.
JR, JW

PASSAGES

Phylls Barney has moved from Ft. Morgan, Colorado to the Fish Disease Control Center at LaCrosse, Wisconsin. Her new address is P.O. Box 1595, LaCrosse, WI 54601.

Beginning with the winter 1990 issue of the Newsletter, Volume 18, No. 1, the editorship will move from the Pacific Northwest to the Southeast. The new address will be Dr. J. Randy MacMillan, Drawer V, College of Veterinary Medicine, Mississippi State, MS 39762. The new phone number will be 601-325-3432.

COHO SALMON SYNDROME IN CHILE

Sandra Bravo S. and Marcelo Campos L.
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Since 1981 the coho salmon reared in saltwater have had high mortality of unknown etiology mainly in Autumn and Spring.

The sick fish locate in the corners of the cages and are lethargic and inappetent. Externally they show darkened body coloration and severe pallor of the gills, without other signs. Internally the kidneys are swollen, particularly in the posterior regions; the liver occasionally has a gray mottling and the spleen is enlarged. The gut is without food and filled with yellow mucus.

The hemathocrit values are approximately 27% in moribund fish and 40-45% in apparently healthy fish. In blood smears it is possible to observe structures the size of bacteria. These are also in smears of kidney, spleen and liver. These structures were found within the cells (macrophages?), free in the smear and also in clusters.

It has not been possible to isolate any pathological agent; however, histological studies have shown several lesions with various grades of severity and the presence of unidentified cells in the kidney as well as in the liver and spleen.

These cells are PAS (+) and contain eosinophilic cytoplasmic granules; some are multinucleated or with amoeboi form. Electron microscopic observation has confirmed the presence of these cells

In this season (Autumn 89) the coho salmon syndrome has been very severe, causing high mortalities in a large number of fish farms in the south of Chile. The mortality level registered is 30 to 90% in coho salmon only, although some coho salmon are reared with other salmonid species (Rainbow trout and Atlantic salmon) that look healthy and without mortality.

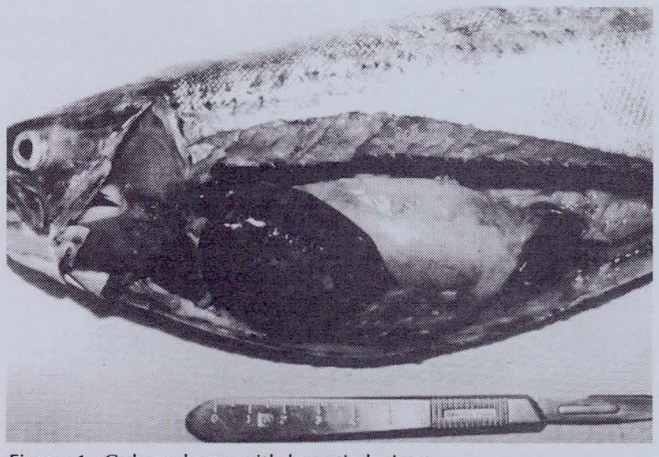

Figure 1. Coho salmon with hepatic lesions.

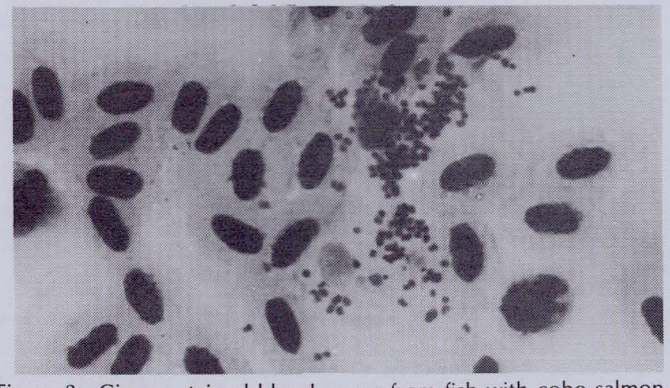

Figure 2. Giemsa-stained blood smear from fish with coho salmon syndrome.

IFAT POSITIVE BACTERIA IN RECTAL SWABS FROM ASYMPTOMATIC CHANNEL CATFISH SUGGEST ESC CARRIER STATE

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Indirect fluorescent antibody tests for detection of *Edwardsiella ictaluri* in diseased channel catfish have been previously described and characterized for specificity (Rogers 1982, Ainsworth et al. 1986). We used the IFAT to determine if *E. ictaluri* could be detected by non-lethal sampling of healthy, antibody-positive adult catfish.

Forty-three, 18-month-old channel catfish were obtained from a commercial fish farm. Fish were individually tagged, bled and held in 16°C well water for three weeks. All fish had serum antibody titer to *E. ictaluri*; 10 fish with titers of 128 or 256 were selected for further study. Five fish each were placed in two, 250 gallon tanks and the water was warmed and kept at 20-25°C for six weeks. Fish were sampled at the beginning of the warmwater period and every two weeks thereafter. Blood was cultured in thioglycollate broths. Blood smears were stained with Leishman-Giemsa and IFAT. Olfactory sac and rectal samples were collected using sterile fine-tipped swabs. Blood agar plates were inoculated with the swabs, and smears were made for IFAT staining. Serum antibody was also monitored.

In one tank, all five fish died after two weeks. Brain, liver and kidney cultures of these fish indicated overwhelming septicemia with gram-negative, oxidase-positive rods. However, three of these five fish had brightly fluorescing rods in rectal swabs collected at the start of the experiment. All five fish were IFAT negative a few days before death. Leishman-Giemsa smears and blood cultures collected from these fish were negative for *E. ictaluri.*

All five fish in the other tank survived the six week period. Three of the fish had fluorescing rods in rectal smears at least once during the study. One fish had positive rectal swabs in three consecutive samples (four weeks), and two fish were positive at the end of the experiment. Antibody levels fluctuated during the experiment, but there was no obvious correlation between serum antibody and IFAT positive fish. All Leishman-Giemsa smears and blood cultures were negative, as were brain, liver and kidney cultures made at the end of the experiment. We did not recover *E. ictaluri* from blood agar cultures of the rectum or olfactory sac in any fish. Cultures from these two areas had heavy growth of many different bacteria. No IFAT activity was detected in either blood smears or olfactory sac smears in this experiment.

In later examinations of catfish from two other sources, one fish was found with fluorescing short rods in a brain smear, and another fish had similar rods in the olfactory sac.

Additional IFAT positive rectal smears were found. Again, however, these results could not be confirmed by culture. The bacteria visible in the IFAT procedure glow bright green and exhibit a strong halo effect, but are present in small numbers. We have also observed fluorescing short rods in individual fish with no serum agglutination titer to *E. ictaluri.* Control slides were prepared using smears of *E. tarda* and *Aeromonas hydrophilia.* No fluorescence was observed.

These results indicate that the bacteria causing ESC may be able to survive in the rectum of apparently healthy channel catfish for long periods, and that carrier fish may be the source of ESC outbreaks in addition to contaminated pond bottoms (Plumb and Quinlan, 1986). The presence of IFAT positive short rods in the olfactory sac and rectal area supports the findings of Shotts et al. (1986) indicating that the gut and the nares were the primary sites of infection by *E. ictaluri.* Further research is needed to better define the use of IFAT to identify carrier fish, and to develop better means of culturing the bacterium from heavily contaminated samples.

VARIATION IN FISH INTERFERON—LIKE ACTIVITY: CELL LINE PRODUCTION AND IHN VIRUS ISOLATE SENSITIVITY

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Interferon-like activity in fish cells has been described for a number of fish cell lines (Hedrick et al, 1976, J. Fish Dis. 1:297-308; deKinkelin and Dorson, 1973, J. Gen. Virol. 19:125-127). The activity is characterized by the induction of resistance in cells to viral infection and by its resistance to acid treatment, pH 2.0, resistance to deoxyribonuclease and ribonuclease digestion, and sensitivity to trypsin digestion (DeSena and Rio, 1975, Infect. and Immun. 11:815-822). The activity can be induced by treatment with inactivated virus, double-stranded RNA or synthetic polynucleotide polymers such as poly I:C (Trapman, 1979, FEBS Lett., 98:107). We have characterized the production of this activity in a number of different cell lines and we have also determined that there are marked differences in the sensitivity of virus isolates to this activity.

Cells lines from rainbow trout gonad (*Onchorhynchus mykiss*) (RTG-2) (Wolf and Quimby, 1962, Science 135:1065-1066), kokanee embryo (*O. nerka*) (K06) (Lannan et al., 1984, *In Vitro*, 20:671-676), sockeye salmon embryo (*O. nerka*) (SSE-5) (Nims et al, 1970, Proc. Soc. Exp. Biol. Med. 135:6-12), and steelhead trout embryo (*O. mykiss*) (STE-137) (Fryer et al., 1965, Ann. N.Y. Acad. Sci. 126 [Art.1]:566-586) were obtained from J.L. Fryer (Oregon State University, Corvallis, Oregon) and tested for interferon activity. The cells were plated onto 96-well microtiter dishes and allowed to grow until they attained an 80% confluent monolayer. All cells were maintained in minimum essential medium (MEM) containing 5 or 10% fetal calf serum. At the time of treatment with the interferon inducer poly I:C (Boehringer-Mannheim), the medium was removed and 200 ul of poly I:C (6ug/ml in MEM containing no fetal calf serum (MEM-O]) was added to each well. Control cells received MEM-O alone. After 24 hours, the inducer was removed by two washes for 5 min each with tris buffered saline. Following the wash, 100 ul of infectious hematopoietic necrosis virus (IHNV) in MEM-5 was added to the cells from a ten-fold dilution series which ranged from 10^{-1} to 10^{-6}. Interferon-like activity was measured by the difference in virus titer in control, untreated cells vs. poly I:C treated cells.

Differences in the viral induced cytopathic effect (CPE) between treated and untreated cells is clearly demonstrated in Figure 1. In Plate A, the darkly staining wells indicate cells that have not been destroyed by virus infection and the apparent viral titer for the interferon-treated cells was 5.57 x 10TCID50/ml (Tissue Culture Infective Dose 50%). In plate B of Figure 1, the clear wells represent those wells where all of the cells have been destroyed by the virus infection and the viral titer for these control cells was 5.57 x 10^6TCID50/ml. Thus, a measure of the interferon activity was taken as the difference (protection) between the log of the virus titers for treated and untreated cells, a four log difference in this example.

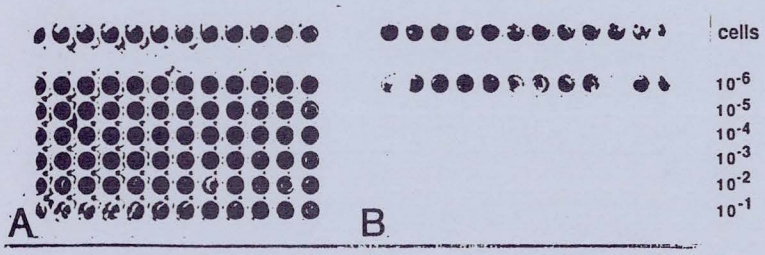

Figure 1. KO6 challenged with IHNV 039-82. The photograph illustrates the differences in viral-induced CPE in cells that were treated with poly I:C. A = poly I:C, B = control

Four IHNV isolates from different fish species were tested for their sensitivity to the interferon-like activity produced by RTG-2 cells. The isolates included Lake Auke (LA) (sockeye salmon), Round Butte-1 (RB1) (steelhead salmon), 039-82 (rainbow trout), and Coleman-3 (CO3) (chinook salmon) (Hsu et al., Appld. & Environ. Microbiol., 1986, 52:1353-1361). The result of these studies are schematically presented in Figure 2. Each bar graph represents the mean of three assays which compared the viral titer for a particular IHNV isolate in cells treated and untreated with poly I:C. The difference is plotted as the mean log difference; the larger the number, the more sensitive is the virus to the induced interferon-like activity. The LA virus was the most sensitive isolate and a 3.5 log difference was found in cells treated with the interferon inducer. Nearly as sensitive was the CO3 isolate with a mean log difference of 3. The isolates RB1 and 039-82 were less sensitive to the induced activity and only 2 logs of reduction in virus titer was observed. The titers for each of the isolates were LA, 1 x 10^6TCID50/ml; RB1, 6.85 x 10^5TCID50/ml; 039-82, 5.6 x 10^5 TCID50/ml; and CO1,3.9 x 10^5TCID50/ml.

The same viral isolate, 039-82, was then tested for sensitivity to interferon in the four cell lines. This experiment was designed to determine whether there was any variation in the level of interferon-like activity induced in the different cell lines. Treated SSE-5 cells were the most effective in reducing the titer of 039-82; the mean log difference was 4.5. In the other *O. nerka* line, KO6, the mean log difference was also substantial at 3.6 logs. However, poly I:C treatment of the *O. mykiss* cells lines, STE-137 and RTG-2, did not result in the same level of protection; there was only a 2.5 and 2 log reduction in virus titer respectively. It is possible that 039-82 which was isolated from rainbow trout has adapted to growth in cells of this species and is more resistant to the interferon-like activity produced by these cells.

An interferon-like activity in four different cell lines has been induced by treatment with poly I:C, a potent interferon inducer. There was considerable variation in the level of activity that was induced among these cells and the results of this study suggest that the SSE-5 cell lines would be the cell line of choice to study interferon induction. We also observed differences in sensitivity of a single virus isolate of IHNV, 039-82, to the antiviral activity induced in the four cell lines. The fish interferon is capable of protecting fish cells against the cytopathic effects of IHNV infection and should be useful as an immune adjuvant.

The authors wish to acknowledge the suggestion of Bill Eaton (Univ. Alaska, Juneau) to carry out these experiments. This report is the result of research sponsored by Oregon Sea Grant with funds from the National Oceanic and Atmospheric Administration, Office of Sea Grant, Department of Commerce, under Grant no. NA85AA-D-SG095 (project no R/FSD-11) and, in part, from funds from Bonneville Power Administration Contract DE-A179-84BP16479, Project 84-43 (G.R. Bouck and R. Morinaka served as the Contracting Office Technical Representatives on the project).

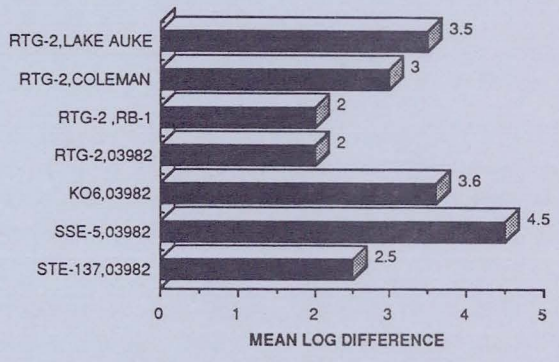

Figure 2. Bar graph representing the mean log difference in TCID50 results of CPE reduction assays seen in each experimental cell type and IHNV isolate combination between control and poly I:C treated cells.

FRESHWATER INVERTEBRATES ACCUMULATE LEVELS OF SELENIUM THAT ARE POTENTIALLY TOXIC TO FISH AND WATERFOWL

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Results of recent biological surveys at the Kesterson National Wildlife Refuge in the San Joaquin Valley of central California reported that populations of some fish and invertebrates in this area are contaminated with selenium (Se) and several other elements. Contaminants, principally Se present in the agricultural irrigation drawinwater, have caused Kesterson Reservoir to become an area of concern because of potential effects on fish and waterfowl.

We conducted four 48-hour static acute toxicity tests with the cladoceran, *Daphnia magna,* and the midge, *Chironomus riparium.* Groups were exposed to either: (1) sodium selante, (2) sodium selenite, (3) a 6:1 mixture of sodium selenate to sodium selenite (as Se), or (4) seleno-L-methionine in a reconstituted water representative of the San Joaquin River. The 6:1 Se mixture was chosen to be representative of environmental proportions of selenate to selinite in the Kesterson Reservoir. *D. magna* and *C. riparius* were also exposed in flow-through toxicity tests to the 6:1 mixture (as Se) in 21- and 30-day chronic exposures, respectively. Endpoints monitored in these tests included survival, growth, reproduction, and changes in whole-body ions of these two invertebrates.

Freshwater invertebrates exposed to waterborne Se during chronic laboratory toxicity tests accumulated Se to concentrations that have been shown to be toxic in the diet of fish and waterfowl. Waterborne inorganic Se was not lethal to the cladoceran *D. magna* up to 711ug/L, allowing them to accumulate whole-body ion concentrations of Se that may be detrimental to higher trophic levels. Daphnids exposed to sublethal Se concentrations of 85 ug/L for 21 days accumulated 21 ugSe/G (dry weight). Se in the diet of fish or birds at about 5-10 ug/g reportedly has adverse effects on growth, survival, or reproduction. The freshwater Criterion Continuous Concentration for Se of 5ug/L recommended by the U.S. Environmental Protection Agency (EPA) is probably protective of invertebrates. However, bioaccumulation of Se by invertebrates may pose a toxic threat to fish and waterfowl through the food chain even though water concentrations are near the EPA guideline.

D. magna was more sensitive than *C. riparius* to the acute toxic effects of inorganic Se. Selenate tended to be less toxic than selenite. Seleno-L-methionine was extremely toxic to *D. magna,* but not to *C. riparius.* In long-term exposure, emergence time of adult *C. riparius* was delayed at Se concentrations above 303 ug/L.

D. magna reproduction and intrinsic rate of natural increase (r) were reduced at Se concentrations $\geq$ 348 ug/L after 21 days. In addition, adult growth was reduced at Se concentrations $\geq$ 156 ug/L. Daphnid whole-body magnesium, potassium, and sodium were not affected by chronic Se exposure; however, whole-body calcium increased at intermediate Se concentrations. In addition, whole-body chloride was reduced at 711 ug Se/L. These changes in whole-body ions in *D. magna* were less sensitive indicators of Se toxicity than growth. Perhaps the daphnids were able to acclimate to elevated Se concentrations during the 21-day exposure and regain net ionoregulatory balance.

Daphnids experienced 50-70% mortality in 48 hours at selenomethionine concentrations of 4-8 ug Se/L. However, this organic form of Se was about 1000-fold less acutely toxic to *C. riparius.* Although the toxicity of inorganic Se to freshwater invertebrates has been previously investigated, little data are available on the chronic toxicity of organic Se compounds. If the ratio of acute to chronic toxicity of selenomethionine to *D. magna* is similar to that for inorganic Se, then the Maximum acceptable Toxicant Concentration for selenomethionine would be about 0.16 ug/ Se/L. Within the Kesterson National Wildlife Refuge, waterborne organic Se reportedly represents up to a quarter of the total present. Additional data are needed on the occurrence, toxicity, and fate of naturally occurring organic Se compounds in fresh water before the hazard of Se in the aquatic environment can be adequately addressed.

This study was supported by the San Joaquin Valley Drainage Program, a cooperative effort between the State of California and the U.S. Department of the Interior.

ADVERSE EFFECTS OF HEATED BOUIN'S FIXATIVE ON FISH TISSUES

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Several researchers recently have advocated fixtion of whole fingerling rainbow trout (*Oncorhynchus mykiss,* formerly *Salmo gairdneri*) for 10 minutes in 48°C Bouin's solution to preserve gas bubbles in the fish for determining the histological effect of gas supersaturation. In a test of the fixation method during gas supersaturation studies of lake trout (*Salvelinus namaycush*) and Atlantic salmon (*Salmo salar*), we found tissue changes apparently induced by the fixation method that interfered with interpretation of expected gas-induced pathology. As the species and size of fish being studied were different from that in the published method, a test was conducted with rainbow trout of two sizes and one size of lake trout to determine if the tissue changes noted were possibly species or size dependent.

Five rainbow trout (110-120 mm), 10 lake trout (100-110 mm) and 10 rainbow trout (35-38 mm) were euthanized with tricaine methanesulfonate and placed in 48°C Bouin's solution for 10 minutes and then transferred to Bouin's solution at room temperature (23°C) for overnight fixation. The abdominal cavities of the larger fish were opened and the gas bladder punctured before immersion in the fixative. An equal number of each group were fixed only in 23°C Bouin's solution as the control standard.

All fish fixed at 48°C showed severe scoliosis due to muscle contraction. The opercula and gills were flared, often to extremes, and the isthmus in the larger fish was frequently torn loose from the lower jaw. The small rainbows showed exophthalmia and greatly curled fins.

All fish fixed at 48°C retained a very soft texture and were easily damaged when handled. Tissues shattered during sectioning and it was difficult to obtain quality sections. Staining quality did not appear to be greatly affected but nuclear detail was reduced in some cells, particularly the hepatocytes.

Histologically, the greatest effect was seen in the muscle, where contractions of the muscle fibers left large, open areas. These could be interpreted as massive edema if the history of the specimen were not known. The mucosa of the gastrointestinal tract tended to separate from the muscle layers and mucosal autolysis appeared greater in the fish fixed at 48°C. There was some equivocal evidence of smooth muscle contraction in major arteries. These changes occurred in both large and small fish.

The muscle contraction and severe change in body conformation observed in these tests suggest that location of any gas bubbles found might not be true and that the contraction might be violent enough to generate bubbles under some conditions. We conclude that this fixation technique has several disadvantages and offers no advantage over standard fixation procedures; therefore, we recommend heated fixatives not be used for this purpose.

COMMITTEE REPORTS

NOMINATING COMMITTEE

The Nominating Committee has generated a list of candidates for President-elect, Board of Certification and Nominating Committee. These are:

For President-Elect
- Keith Johnson
- Randy MacMillan
- Charlie Smith

For Board of Certification
- John Hnath
- Kent Hauck
- Bob Olson
- Ron Thune

For Nominating Committee
- Scott Foott
- Rod Getchell
- Dave Groman
- Scott LaPatra

Submitted by
Craig R. Banner

FINANCE COMMITTEE REPORT

As of July 10, 1988 the Fish Health Section had a total $13,327.65. The monies were distributed as follows: General Acct. $2269.27; Certificate Acct. $3407.51; Glossary Acct. $1651.80 and Blue Book Acct. $5999.00. The last two accounts were held at the AFS office. Since glossaries are no longer being sold the Glossary account was closed and that money added to the General Account.

In January 1989 the notebook containing a summary of the financial records was destroyed by fire. Fortunately, receipts etc. were kept in a file in another office. Hence, the financial report for this year is as accurate as possible based on these records. The two accounts — General and Certificate have been combined. As of June 30, 1989 a total of $2,562.87 is distributed between a checking and savings account in the Fulton Federal Bank in Athens, GA and $7630.90 at the AFS office. A detailed account of this year's income and expenses are listed below.

Interim FHS/AFS Financial Report for Annual Meeting
July 10, 1988 - June 30, 1989

	Transactions	Subtotal	Total
FHS General Account (includes general, certificate, glossary)			
Beginning Balance			7328.58
Credits			
Blue Book	60.00		
Membership Dues	2132.50		
Cert. Appl. Fees	240.00		
Interest	278.26	2710.76	10039.34
Debits			
Meeting abstracts (1988)	2290.00		
Newsletter	2135.00		
Mailings	551.22		
Membership drive	554.00		
1989 meeting	720.00		
AFS raffle cont.	100.00		
Certification forms	433.40		
Cert. seals etc.	392.85		
Lawyers fee	60.00		
Banquet speaker	250.00	7476.47	
Ending Balance			2562.87
Blue Book Account			7630.90
GRAND TOTAL			10,193.77

Submitted by
Vicki Blazer

AWARDS COMMITTEE

S.F. Snieszko Distinguished Service Award

Dr. Douglas Anderson was nominated for this year's award. He was unanimously approved by the awards committee and the executive committee was notified of their recommendation. The awards committee suggests recipients of the Snieszko award be given an 8 x 10 framed color photograph of Dr. Snieszko's portrait in addition to the plaque.

Additional Awards

Members of the awards committee discussed giving awards other than the Snieszko award and make the following recommendations.

The establishment of a lesser awards known as a SPECIAL ACHIEVEMENT recognition, given intermittently as appropriate, for FHS members (or even non-members) for any of the following:

1. A unique contribution to the fish health field—such as a new diagnostic tool, a technique to control or prevent the spread of a serious disease, or discovery of a new control agent.
2. A significant research accomplishment—such as elucidating the life cycle of *Myxobolus cerebralis*, the route of infection of a disease, or a culture technique for a previously unisolated pathogen.
3. Outstanding leadership in resolving a major fish health-related resource problem—such as a new fish health policy, disease control program, drug registration, etc.

It would be necessary to establish rating criteria, develop a nominating procedure, and to appoint a review board for selecting recipients. The standards should be high, and more than one award could be given in a single year, and that an award need not be given every year. It would be important to be timely in giving the award—it should be done within 1 year after the significant accomplishment was completed. The recognition could be in the form of a nice certificate suitable for framing or a modest plaque.

Plaque for past recipients of the Snieszko Award

I have initiated a search for an appropriate plaque on which to place the names of past winners. The board will be placed next to Dr. Snieszko's portrait. I will assume responsibility for completion this project.

Report submitted my members
G.L. Bullock, Chairman
J.L. Fryer, F.P. Meyer

LONG RANGE PLANNING

No formal actions have been taken by the committee at the present time. The approach to the planning process, however, has been discussed and a tentative procedure developed. The present plan is to contact all members of the executive committee (officers and chairs of standing and ad hoc committees) to get them to put down on paper the strengths and weaknesses of their present position and committee. More importantly, however, is that each individual will be asked what each office or committee could accomplish in the future. Essentially, what direction should we be going to make the Section more active and less reactive? Where do we want to be by year 2000?

My current plan is to circulate the requests to these individuals in August of 1989 with the hopes of having something of a draft of a long range plan by 1990.

Submitted by
R.P. Hedrick, Immediate Past President

**Because of space limitations and the length of the questionnaire, the editors have omitted this document. It can be obtained from John Thoesen.*

BLUE BOOK FIELD ADVISORY

Past President, Ron Hedrick met with me at the Whirling Disease Conference in Denver, Colorado, April 12, 1989, and discussed Blue Book revision possibilities. I was asked by Ron to Chair and form a committee to revise the Third Edition of the Blue Book I accepted and have an excellent committee of fish health experts. I am very proud of the committee efforts to date and I expect a Fourth Edition the Section will be extremely pleased with.

The following people are serving on this committee:

John C. Thoesen, Chair
Chris Horsch, Parasitology
Jack Frimeth, Parasitology
Scott La Patra, Virology
Jack Ganzhorn, Virology
Steve Roberts, Bacteriology
Diane Elliott, Bacteriology

The Committee met very briefly during the International Fish Health Conference in Vancouver, Canada last August.

Our first major meeting was held on October 4-5, 1988, at the Coleman National Fish Hatchery. Many items were discussed but the main emphasis was to develop a questionnaire for the January Newsletter that would address how the Section wanted the Fourth Edition to be revised. Time frames for completion of the Fourth Edition were also discussed.

Six hundred questionnaires were sent out in the January newsletter. I wrote a short paragraph for the newsletter explaining the purpose of the questionnaire and a response date which for some reason was not incorporated in the Newsletter as I wrote it.

I am very disappointed that only sixty-four out of the six hundred were returned, 10.6%. The results have been sent to Jim Winton for inclusion in the next newsletter.*

President Doug Anderson has been provided with a copy of the questionnaire results and a letter from me addressing items I will present to the Executive Committee at the Eastern Fish Health Workshop in July.

I am trying to arrange for our next meeting to be held in conjunction with the July meeting also.

Respectfully submitted
John C. Thoesen, Chairman

Editor's Note: Because of space limitations and the length of the questionnaire, the editors have omitted this.

NEWSLETTER AND PUBLICATIONS

The Newsletter was published on a quarterly basis. The Committee continues to urge the membership to submit material to be considered for dissemination. Although the quantity and quality of articles received are good, the committee would like a broader representation of the Section. We also feel that the Newsletter should not only be a vehicle for presenting results of investigations and observations, but should, in addition, be a forum for debating fish health issues.

At the present rate of sales, the current edition of 1500 copies of the "Blue Book" will be sold out within one year. The Newsletter and Publications Committee recommends that the Section consider this issue.

Submitted by
John S. Rohovec, Chairman

SCIENTIFIC JOURNAL

The Journal of Aquatic Animal Health is off to a good start with the first issue expected by mid summer. A total of 87 manuscripts were generated from the International Fish Health Conference held in Vancouver in July, 1988. An additional 19 manuscripts not associated with that conference have also been received. Fifteen to twenty of the manuscripts were rejected for various reasons. The first 15 manuscripts have been sent to AFS for inclusion in Volume 1, Issue 1 of the Journal of Aquatic Animal Health. An additional 15 manuscripts are ready to be forwarded to AFS, while the others are in various stages of review or revision.

Submitted by
John A. Plumb, Acting Chair

FHS/AFS INTERNATIONAL FISH HEALTH CONFERENCE

From the scientific standpoint, the Conference was, by all reports, a great success. There were almost 400 registrants and the Conference attracted speakers from 23 countries. During the three days of meetings, 162 papers and 53 posters were presented. This large number of presentations was accomplished by running two concurrent sessions during each of the three Conference days. Some 18 of the papers and 4 of the posters dealt with shellfish disease topics, indicating that scientists in this field consider FHS meetings a worthwhile forum for their work, and suggesting that the Section might be able to expand its membership by catering more to the interests of shellfish scientists.

From the financial standpoint, the Conference did not do quite as well. The Conference ended up with a deficit (approximately $366 U.S.), a deficit that might still be reduced if 22 of the remaining Conference Handbooks can be sold. The primary cause of the deficit was the extremely low registration fee charged for the Conference ($50 to $55 CAD, depending on the time of registration). Organizers of future conferences are advised to charge considerably higher registration fees to avoid future deficits.

The Conference Chairman would like to take this opportunity to thank the large number of people who helped in organizing the Conference, in particular, Ron Hedrick and Jim Winton, whose help in large measure accounted for the excellence of the Conference program.

A financial statement regarding the Conference is attached.

Submitted by
Trevor P.T. Evelyn

Financial Statement Regarding the FHS/AFS International Fish Health Conference, held in Vancouver, B.C., Canada on July 19-21, 1988

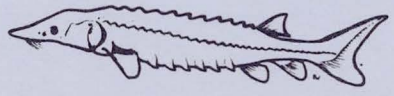
Receipts*	$ (Canadian Funds)
AquaHealth $500.00	
USFWS	1,080.00
WFD Conference	714.00
Conference Handbook Sales	244.87
Hotel Room Credit	415.80
Bank Interest	232.82
Registration/Banquet fees	20,396.48
	23,583.97

*Financial assistance from Biomed, Inc. is not shown here because it was paid directly to the hotel that served as the Conference site.

Expenditures+	
T. Evelyn (hotel research trip)	50.00
Registration costs (name tags, envelopes, etc.)	267.78
Poster stands/boards	228.70
Cheque books and bank charges	21.05
Fee overpayment refunds	23.13
Gratuity dinners (T. Evelyn's secretary)	50.00
Hotel charges (meeting rooms, break refreshments, banquet costs)	20,652.64
Total	21,293.30
Balance (CAD $)	$ 2,290.67
Equivalent in U.S. $	$ 1,924.17

+Expenditures did not take into account the cost of producing the Conference Handbook ($2,290 U.S.). When the above cost is taken into account, the net balance of holding the Conference was a negative one: $1,924.17 - $2,290.00 = $365.83.

Submitted by
Trevor P.T. Evelyn



Committee Reports (continued)

BOARD OF CERTIFICATION

During the past year, four Fish Health Inspector (FHI) applications were reviewed; two of the applicants were certified and two were denied certification. One additional application is currently under review. Ten Fish Health Inspectors received five year recertifications, seven of these for their second five year period. One Fish Health Inspector was denied five year recertification (he had been recertified once previously) and two FHI certifications expired. At present there are 36 active and 5 former (retired, expired or not renewed) fish Health Inspectors.

Five Fish Pathologist (FP) applications were reviewed; four applicants were approved to take the FP qualifying exam from the Professional Standards Committee and one was denied certification. Two of the four preliminarily successful applicants from this year and one preliminary applicant from last year took the exam and all passed, completing the requirements for certification. Two candidates have yet to take the exam. Two additional FP applications are currently under review. Five Fish Pathologists received five year certification, all for the first time. At present there are 52 active and 3 former (retired or expired) Fish Pathologists.

An expenditure of $320 was made to print blank application forms.

BOARD OF CERTIFICATION SUMMARY TO DATE:

Fish Health Inspector:

Total Number of Applicants	66
Number Certified	41
5-year Recertification	20
10-year Recertification	7

Fish Pathologist:

Total Number of Applicants	80
Number Certified	55
5-year Recertification	15

Submitted by
Joseph R. Sullivan, Chairman

ARCHIVES

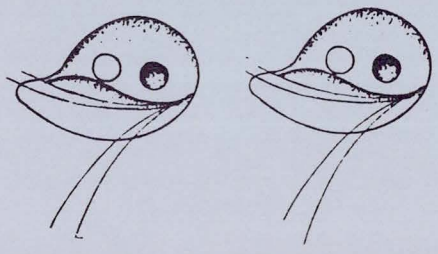
On a trip to the main office of the American Fisheries Society in Bethesda I found that the records of the Fish Health Section on file there include:

-- correspondence concerning the establishment of the Section from 1971-72,
-- correspondence from January 1973, date of establishment of the Section, to the present,
-- certification records, and
-- reports of the Chair of the Section filed in the meeting books of the parent organization.

If other records are either thought to be stored there or need to be moved there, the Archives Committee should be informed.

Although the history of fish disease is not exactly the business of this committee, I have asked other members of the committee to consider submitting short articles on the history of specific diseases to the Newsletter in the next year. A couple of us have decided to write up summaries to submit hoping to stimulate some interest in the history of fish disease among members of the Section.

Submitted by
Margaret S. Ewing



PROFESSIONAL STANDARDS

In November of 1988, the chairmanship of the PSC changed in order for John Schachte to move on as the new AFS/FHS president. In fact, almost the entire membership of the PSC has changed.

The Fish Pathologist certification program, implemented January 1, 1982, has served to identify qualified fish health professionals. As time marches on and I become increasingly aware of the growth of aquaculture, the involvement of more veterinarians, the greater complexity and diversity that exists within fisheries and especially aquaculture, I see the need to strengthen our certification program and correct some of its problem areas.

Strength can be achieved through (1) increased academic requirements, (2) a more comprehensive examination, (3) a proficiency testing program, and (4) an ongoing education program. Recommendations are already being drafted, for review, to modify some requirements in *Standards and Procedures for the Certification of Fish Pathologists* and to correct some problem areas (e.g. "work experience gained prior to meeting the basic academic education and specialized training requirements does not qualify as professional work experience").

The fish pathologist examination has already seen one revision in the past few months and within the next two years is expected to consist of 150 multiple-choice questions, fifty 35 mm transparencies and/or microscope slide preparations, and some essay. New avenues for obtaining exam questions are being pursued as the first two attempts met with very limited success. Guidelines for preparing exam questions are now almost complete.

By early next year we should have a handout for exam applicants addressing the scope of the examination and the preparation required for it which will include a list of references.

If proficiency testing and ongoing education programs are adopted as goals by the FHS, they will be discussed in some detail in a future Newsletter issue. These endeavors, however, will serve to increase our "professionalism", give the certification program greater credibility and respect, and hopefully translate into improved fish health care.

This committee would welcome any comments or suggestions as these programs are still in the developmental stages. **GET INVOLVED.** This is the perfect time to express **YOUR** concerns, hopes, and frustrations.

Submitted by
John D. Cvitanich, Chairman

Fish Pathologist Examination Application Deadline for October Exam

Individuals seeking certification as an AFS/FHS Fish Pathologist must have their application reviewed and be approved for the qualifying exam by September 1, 1989. The examination will be scheduled during the week of October 2, 1989. Examinees will be notified of exact dates. The application deadline for the 1990 summer exam is June 1, 1990.

Application forms and information concerning required qualifications can be obtained by calling the Chairman of the Board of Certification, Joe Sullivan, at (907) 344-0541 or the Chairman of the Professional Standards Committee, John Cvitanich at (503) 746-1442.

ERRATUM

In Volume 17, no 1, page 6 of the Newsletter, Piacentini and Rohovec reported that acridine orange can be used as a differential stain for blood cell viruses. Part of the procedure which is critical to success was omitted. The procedure should read: "Blood smears are fixed (absolute methanol or 1:1 methanol/ethanol are acceptable) for 10 minutes, followed by successive rinses (2 min. each) in 100%, 70%, and 50% ethanol. Stain smears with 0.1% aqueous acridine orange for 5 min., wash with water, **then place in phosphate buffered saline (PBS) for 2 min.** Better results are obtained if the slides are examined without mounting with coverslips. For additional information, contact J.S. Rohovec, Department of Microbiology, OSU, Corvallis, OR 97331, phone 503-737-4441.

HIGH UV DOSE RATE PREVENTS TRANSMISSION OF EPIZOOTIC EPITHELIOTROPIC VIRUS DISEASE

John R. Crowther
Leif L. Marking
National Fisheries Research Center
P.O. Box 818
La Crosse, WI 54602-0818
and
Gary A. Wedemeyer
National Fisheries Research Center
Building 204, Naval Station Puget Sound
Seattle, WA 98115-5007

Epizootic Epitheliotropic Viral Disease (EEVD) has devastated lake trout (*Salvelinus namaycush)* production at the Iron River National Fish Hatchery, Wisconsin, during the last several years. State lake trout hatcheries in Michigan and Wisconsin have also been seriously affected. At the Iron River hatchery, losses totaled about 4 million fish in 1986, the entire 1987 year-class, and approximately 1.5 million fish in 1988. In an attempt to control this disease, the entire broodstock was destroyed in 1988 and the hatchery and water supply were disinfected. Although no effective treatment is known for EEVD, we have found that treating an infected water supply with high levels of ultraviolet (UV) light can prevent horizontal transmission of EEVD.

We created a disease reservoir by holding a group of 20 yearling lake trout with an active infection of EEVD in a head tank at a loading density of approximately 0.05 lb/gal. The flow was maintained at 3 gpm to provide two water exchanges per hour. The effluent water from the disease reservoir was split and directed to either test or control tanks, each containing 20 uninfected lake trout. The control tank received untreated water, while the test tank received water treated with a UV sterilizer system (a 2,537 angstrom lamp) at a calculated dose rate of approximately 263,000 microwatt sec/cm^2. Dissolved oxygen levels were 8 to 9 ppm throughout the study and the water temperature was 12° C 953° F) in all tanks.

The test and control tanks were disinfected by treatment with 200 ppm chlorine (calcium hypochlorite) for 1 hour. The UV sterilizer was treated with 500 ppm Hyamine overnight. To initate a test, water flow was started and uninfected lake trout were stressed by suspending them in a net above the water for 45 seconds. The fish were then placed into the test or control tank. To provide further stress and to increase disease susceptibility, the fish were not fed throughout the experiment.

The test period extended over 47 days and included three cycles of EEVD. A cycle consisted of the time required for transmission, infection, and disease to occur. It ended when 90% mortality had occurred in the untreated control tank. Dead fish were removed daily to minimize the possibility of horizontal transmission of the infectious agent between the test and control tanks by personnel. At the end of each cycle, surviving fish were removed and the control tank was disinfected with 200 ppm chlorine. The fish held in the UV-treated water remained in that tank throughout the 47-day period. Uninfected fish were added to the reservoir tank to replace mortalities as they occurred, to maintain active EEVD in the head tank.

Ultraviolet light at a high 263,000 mws/cm^2 dose rate prevented infection in the test group of 20 fish exposd for 47 days; no fish died and none showed critical signs of the infection. Concurrently, fish held in untreated water (controls) suffered a 90% mortality during each of the three disease cycles. In each cycle, mortality began 12 days after stocking. Ninety percent mortality occurred on days 17, 33, and 47.

To confirm that the fish were susceptible to the viral infection, the UV system was turned off after the 47-day test period to expose the fish to EED virus. The fish began to die 10 days later and showed typical signs of EEVD.

The UV level tested (approximately 263,000 mws/cm^2) is high and was deliberately selected because only limited information is available on EED virus. Lethal dose levels for most fish pathogens typically range from 10,000 to 20,000 mws/cm^2. Further work should be done to determine the minimum effective UV dose rate that will prevent horizontal transmission of EED virus under actual hatchery conditions.

REOCCURRENCE OF VEN EPIOZOOTICS IN ALASKAN PACIFIC HERRING

Ted Meyers
Alaska Dept. Fish & Game
Juneau Fish Pathology Lab
P.O. Box 3-2000
Juneau, AK 99802

In June of 1985 a major VEN eipizootic was reported in Ward Cove, Ketchikan, Alaska resulting in several thousand herring mortalities in yearling fish (Meyers et al.). An identical epizootic has occurred again in 1989 during late May and all of June in the same location with similar clinical signs of pale gills and colorless blood accompanied by large scale fish kills of juvenile herring. Simultaneously, another epizootic occurred 230 miles to the north in Auke Bay, Alaska. In both of these recent episodes behavioral abnormalities in affected fish were prominent and included spawning in fresh water and spinning or other distress activity near the water's surface. Aberrant behavior at the water surface in Auke Bay resulted in bird predation producing large open wounds on the backs of herring sighted two weeks prior to mass mortalities of apparently normal fish at low tide. Moribund fish had severe erythroblastosis and typical VEN cytoplasmic inclusion bodies in up to 75% of their erythrocytes within a 1000 X field. Inclusions were confirmed by TEM to be surrounded by typical Iridovirus type particles often in paracrystalline arrays. In Ward Cove this year, 46/48 fish randomly collected had VEN inclusion bodies and 23/23 fish were infected in the Auke Bay samples. Hematrocits from 10/13 of the infected Auke Bay fish were less than 40% with some as low as 5-9%. Most of the herring mortality involved yearling fish although larger age classes were also affected. VEN is rarely the sole cause of death in fish but does lower host resistance that predisposes to mortality from environmental stressors and other infectious agents. However, in Alaska these epizootics in herring clearly cause a severe hemolytic anemia that is directly responsible for mortalities in addition to loss caused indirectly by predation, etc. in debilitated fish. The yearling herring this year belonged to an exceptionally strong year class and the possibility that these epizootics are density dependent is very plausible.

HEPATIC LESIONS IN CULTURED RED DRUM, *SCIAENOPS OCTELLATUS*

Arunthavarani Thiyagarajah, John R. MacMillan,
Alexander D. Munson, and Lloyd W. Bennett
College of Veterinary Medicine
Drawer V
Mississippi State University
Mississippi State, MS 39762

During 1988, significant mortality of red drum, *Sciaenops ocellatus* occured in redfish culture ponds in Mississippi. Fish were shipped on ice to the Fish Disease Diagnostic Laboratory, Mississippi State University. Histological evaluation of livers and other visceral organs showed a variety of lesions. Hepatic lesions were consistent in 6 fish examined. Liver tissue was riddled with areas of fatty degeneration and hepatic regeneration. Numerous pigment-laden macrophage aggregates containing ceroid and hemosiderin were scattered in liver and other visceral organs. The hepatic lesions observed in these red drum suggested toxic liver injury.

Two and three month-old feed samples (2) which had been held at room temperature by the producer were analyzed by thin layer chromatography for the presence of mycotoxins. The mycotoxins tested were aflatoxins B1, B2, G1, G2; zearalenone, T-2 toxin, diacetoxyscirpineol, vomitoxin, sterigmatocystin, citrinin and ochratoxin. Three month-old feed sample contained approximately 0.3 ppm vomitoxin. Toxic liver injury in these red drum could be associated with continuous feeding of feed contaminated with low levels of vomitoxin. However, definite conclusions cannot be made until these lesions are experimentally reproduced under carefully controlled conditions.

IN MEMORIUM

EMMY EGIDIUS

Emmy Egidius, President of the European Association of Fish Pathologists, died on 3 February, 1989. We have lost a valued colleague and good scientist.

Emmy's background was bacteriology and she became one of the first in Norway to recognize the importance of fish and shellfish pathology. Investigations into gaffkemia, an infectious disease of lobsters, began in the 1960's at the Institute of Marine Biology (Univ. of Bergen). A permanent position at the Inst. of Marine Research (Fiskeridirektoratet) in Bergen, opened the way for her major work, investigating vibriosis in both wild and farmed fish.

She helped prove that the "Hitra-disease" was of bacterial origin, and the causal agent was a new species which she named *Vibrio salmonicida.*

Other contacts within the growing fish farming industry in Norway made Emmy aware of the economic importance of vibriosis. She was thus among the farsighted few in Norway to begin developing a vaccine against vibriosis. In the 80's, this work was carried further, and a new vaccine was made to combat Hitra-disease or cold water vibrosis.

As well as being a resource for the fish farming industry, Emmy was concerned with the environmental impact of such activity which included the use of antibiotics to treat fish. One of her last published works was, in fact, the effect of Neguvon on the higher crustaceans. She has naturally participated in questions of marine management and was a scientific advisor to the Directorate of Fisheries on the issues of fish and shellfish diseases. She built up an international reknown in this field and was a central figure in the International Council for the Exploration of the Seas. (ICES). Her duties included being a member of the advisory Committee of Marine Pollution and the Working Group on Introductions and Transfers of Marine Organisms, as well as leading the Working Group on Pathology and Diseases of Marine Organisms. In 1987 she was elected President of the European Association of Fish Pathologists.

Despite her busy schedule, Emmy found time to devote to students and younger colleagues. It was as a natural consequence of this activity, that she initiated courses in fish pathology and fish health management. Her appointment as an Associate Professor at the University of Bergen in 1988 made use of her social abilities, her multilingualism and her general wish to aid others. Through her work, Emmy was able to cultivate friendships both nationally and internationally. Her courage, insight and scientific ability will be greatly missed.

B. Hjeltnes

PIETRO GHITTINO (1929-1989)

Dr. Pietro Ghittino died on March 13th after undergoing a long and painful illness that two surgical operations could not control. In spite of his illness during the past three years, Pietro remained active and was updating one of his books until the end of 1988. The field of fish diseases has lost one of its pioneers and I have lost a friend.

Pietro was a veterinarian whose interest turned toward fish pathology in the middle of the 1950's. His wide knowledge was acquired from epidemiological, clinical, histopathological, and bacteriological studies that resulted in numerous technical and scientific papers, reviews, and books. These studies and publications extended his influence into many aspects of zootechnics and pathology throughout world aquaculture.

Pietro was in charge of the fish disease laboratory within the Institute of Animal Science Disease Prevention at Turin, Italy. As a professor he was involved in several educational programs in Italy and abroad. He spent a sabbatical year in the southern United States teaching histopathology of fish.

At the international level, Pietro was a member of the Fish Disease Commission of the International Office of Epizootics since it was founded in 1961. He served as President of this commission from 1975 to 1988. In this capacity, he was instrumental in making veterinarians throughout the world aware of the importance of fish and fish diseases.

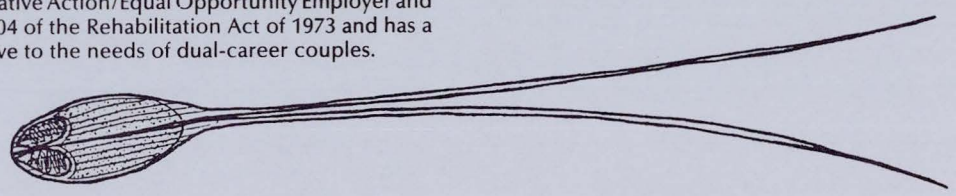
Pietro is survived by his wife, Josafa, two daughters, Stefania and Marcella, and a son, Claudio. All of us in the fish health community send them our deepest sympathies. The memories of Pietro will continue through the work of his son, who has assumed his position at the Institute.

Pierre de Kinkelin

POSITIONS AVAILABLE

The Department of Microbioogy, Oregon State University, seeks applicants for a Research Assistant to work at the Hatfield Marine Science Center, Newport, Oregon, and the Department of Microbiology, OSU, Corvallis. The position involves the study of virulence factors of infectious agents of Pacific Salmon. The applicant is required to possess experience in pathogenic bacteriology, virology, and immunology. A working knowledge of methods used to produce and test monoclonal antibodies and ability to work independently is desired. The position is for a minimum of two years beginning September 1, 1989. Send a letter of application, curriculum vitae, and three letters of reference to: Dr. J.S. Rohovec, Department of Microbiology, Nash Hall 220, Oregon State University, Corvallis, OR 97331-3804 prior to August 15, 1989. Oregon State is an Affirmative Action/Equal Opportunity Employer and complies with Section 504 of the Rehabilitation Act of 1973 and has a policy of being responsive to the needs of dual-career couples.

Graduate Position: In Aquatic Animal Medicine (primarily fin fish), available immediately to study infectious diseases emphasizing any of the areas of bacteriology, virology, parasitology, immunology, or molecular biology. Graduate students earn a MS or PhD in Veterinary Medical Sciences. Generous stipends are available to qualified applicants. Applicants holding either a BS, MS, or DVM degree are urged to apply. Interested individuals should request information and an application packet from: Dr. A. Jerald Ainsworth, Coordinator-VMS Graduate Program, College of Veterinary Medicine, Drawer V, Mississippi State, MS 39762 USA.



SPECIAL CONTRIBUTION

Pat Chapman
Washington Department of Fisheries
Olympia, Washington

I have recently been frustrated in my efforts to obtain certification as a Fish Pathologist by the Fish Health Section and would like to offer the following comments and observations on our certification process in the hope that they will generate discussion within the Section, ultimately resulting in a more efficient and meaningful certification program.

I mailed my application for certification in September, 1987 and received word of the Board of Certification's decision not to certify me in March, 1988. I submitted my appeal for certification to the Professional Standards Committee on July, 1988 and was told recently by the chairman of that committee, that my appeal has yet to be reviewed and that he was unsure of when I might expect a decision. The reasons for denial of my original application or for my appeal do not appear to me to be unusual enough to justify the amount of time being required to make a decision. I do realize that the membership and chairmen of the committees involved changed in the middle of the process, but surely eight months is an adequate period of time for any combination of committee members to review any appeal. While it is true that all members of Fish Health Section committees volunteer their time to these committees and have primary responsibility to their employers, it is also true that membership entails meeting certain responsibilities, including completion of committee work in a timely manner. If these responsibilities cannot be met, then the work should be reassigned to committees that can accomplish it or the deficient members should be replaced.

More important than my personal complaints and frustration over the lack of action on my appeal, however, is the need for revision of the Standards and Procedures for the Certification of Fish Pathologists. Listed below are some suggestions.

* Time limits need to be set and adhered to for each segment of the certification process, including time from receipt of application by the Board of Certification to approval or denial of application; time from denial of application to appeal by the applicant; and time from receipt of appeal to approval or denial of appeal by the Professional Standards Committee. I suggest 3 months for each of these cases. A time limit of one year is already required from approval of application to administration of the written exam.

* The standards require that applications denied approval be returned to the applicant with "a summary explanation of the reasons for nonapproval". The letter accompanying my denied application stated, "some of the comments from the Board were as follows: "Since most appeals probably are based upon the comments received from the reviewers, if only **some** of the reviewers' comments are revealed, it is likely that an appeal might not address important issues that could reverse the denial. Applications returned following denial should include **all** comments from reviewers. This should apply to both the Board of Certification and the Professional Standards Committee.

* The educational and work experience standards are needlessly inflexible and do not currently reflect standards that were acceptable for applicants certified during the initial three years of the certification program. I am personally aware of certified Fish Pathologists that were approved during the grandparent period that have been recertified even though they do not meet the current educational standards, yet some recent applicants having similar educational and work experience backgrounds that applied after the grandparent period expired were denied certification. All applicants for certification or recertification should be required to meet the same standards regardless of when their original application was received. A double standard for minimum qualifications serves only to cheapen the value of the certifications for the public, employers, and us. Since the written examination should be the ultimate tool to determine whether an applicant qualifies for certification, an applicant with questionable or borderline educational or work experience should allowed to take the examination.

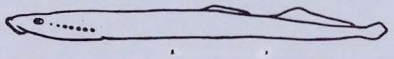
* Applicants for recertification should be required to pass the written examination prior to each recertification. This should apply to all applicants originally certified during the grandparent period and would ensure that all certified Fish Pathologists are knowledgeable of recent developments and techniques in fish health.

* As currently written, the standards require that all education be completed before any work experience can be accrued for certification regardless of how much or what type of work experience was performed prior to meeting the education requirements. This requirement is needlessly inflexible and does not reflect the value of "on-the-job-training" while not enrolled in formal education courses. The standards applied during the grandparent period of certification allowed for substitution of work experience for some portions of education. While this may no longer be desirable, it seems reasonable that work experience which shows proficiency in the required areas of fish health (as outlined in the standards) should be acceptable regardless of whether the educational standards were met when the work was being performed. In other words, any combination of professional work experience and education which meets the standards should be acceptable regardless of when each standard was achieved in relation to the other. A fish pathologist with 15 years of experience but lacking even a single credit hour in, say, histopathology, would currently not be able to be certified until three additional years of work were accomlished after completion of that course, even though the previous work experience met all the criteria outlined in the certification standards.

* Standard procedures for creating, conducting and scoring the written examination should be developed. Currently no standards exist, therefore consistency is not ensured. It is my understanding that the examination is conducted only during certain fish health conferences which often are difficult to attend due to employer budgetary or travel restrictions. Couldn't it also be given by high school or college instructors or administrators in a program similar to college correspondence courses? It seems to me that this procedure would streamline the process somewhat.

* Guidelines for retesting of applicants that fail the written examination do not exist, but must be developed. If an applicant fails the exam three times, perhaps, a waiting period of three years could be imposed before the exam could be retaken. Or perhaps an applicant should be allowed to take the exam as many times as needed to pass provided a certain period of time passes between exams. It is not unreasonable to expect that one day someone will fail the exam, so guidelines should be in place to ensure fairness.

These suggestions are strictly my own opinions based upon my recent experiences with the process of certification. While frustrated in my attempts to obtain certification, the program remains important to me and I'm truly interested in seeing it improve and becoming more meaningful than it currently is. I encourage discussion on my thoughts through this Newsletter and/or at the annual meeting.



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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