History of
Newtown Fish Toxicology

341 I Church Street
Newtown, OH 45244

Robert A. Taft

Sanitary Engineering Center

Newtown Fish Toxicology Station

Kilgour Mansion

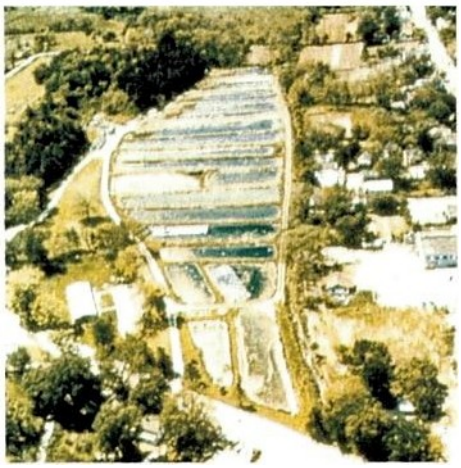
Andrew W. Breidenbach Environmental Research Center

United States Environmental Protection Agency

"Circles the Globe"

History of
Newtown Fish Toxicology
3411 Church Street
Newtown, OH 45244

Dryer, James N., Brungs, William A., Horning, William B.,
Lazorchak, James M., Mount, Donald I., Neiheisel, Timothy W.



Newtown Fish Toxicology Fish Ponds

INTRODUCTION

Shown on the cover: the facility's humble beginnings in downtown Cincinnati, Ohio, the Robert A. Taft Sanitary Engineering Center, the station in Newtown, Ohio, the Andrew *W.* Breidenbach facility. This all contributed to the work of the *United States Environmental Protection Agency "Circling the Globe".*

The Public Health Service (PHS) Drinking Water Standards began with the 1893 Interstate Quarantine Act established under Treasury because of inspection of immigrants for disease. The 1912 PHS law included funds for establishment a field Ohio River unit to determine how stream pollution by waterborne diseases (such as typhoid fever and cholera) was endangering drinking water supplies. In the summer of 1913, the first Federal Government Research Laboratory dealing solely with sewage and water pollution in the United States was established in downtown Cincinnati, Ohio at the Public Health Services Hospital (known as the Field Investigation Station) located in the Kilgour Mansion. The mission was to study pollution and natural purification of the Ohio River. They were to make *'investigations of pollution as it related to the diseases of man'.* This building previously served as a Marine Hospital. From there, in the 1954 the Research Facility was relocated to the Robert A. Taft Sanitary Engineering Center at 4676 Columbia Parkway, and in 1960, plans were developed for Newtown Fish Toxicology.

This publication shows the history of the Newtown Fish Toxicology Station at 3411 Church Street in Newtown, Ohio. It opened in 1962 under the leadership of Dr. Donald I. Mount, Research Fisheries Biologist. Later in the 1960's, Dr. William A. Brungs , Research Fisheries Biologist, took over the leadership when Dr. Mount went to Duluth, Minnesota to become the Director of the Mid-Continental Ecology Division, Environmental Research Laboratory. In 1971, William B. Horning, also a Research Fisheries Biologist, became the new Newtown Director and remained in that position for seventeen years when James M. Lazorchak was appointed in 1988 as the final Lab Director. The Newtown Fish Toxicology Station, as such, closed in 1994. At that time, the functions were transferred to the A.W. Breidenbach Environmental Research Center building At 26 West Martin Luther King Drive in the Clifton area of Cincinnati, Ohio.

The Newtown Fish Toxicology Laboratory was located on eighteen acres of land. An interesting side-story about the previous history of the land that was acquired will be found in APPENDIX D. The original building was begun in 1961 and grew building by building as needed. Additions were put on the side of the original building and then to the rear of it. This building was originally planned to be a 'temporary' structure until a more substantial structure could be constructed. However, this building is still being used, by a private company - Quality Controls, Inc., producers of wastewater equipment products. On September 19, 1976, the new $500,000 addition was constructed behind the "temporary" structures. Dedication ceremonies were held with speakers, Willis D. Gradison, First District Congressman and Ed Maruska , Director of the Cincinnati Zoological Gardens. The dedication brochure can be found in APPENDIX C.

Concurrent with work and development at Newtown ecological and water quality research spread to various areas of the country, Duluth MN, Narragansett, RI, Las Vegas, NV, Corvallis, OR and Gulf Breeze, FL, depending on various pollution concerns of the Nation. It is of interest that the Lab was originally developed while part of the United States

Public Health Service (USPHS). Personnel were then transferred to the Department of Interior (DI), the Federal Water Pollution Control Agency (FWPCA), the Federal Water Quality Administration(FWQA), and finally, on December 2,1970, the lab was incorporated into the newly established United States Environmental Protection Agency (USEPA). All of this occurred while personnel maintained the same desks in the same rooms.

The total known staff of the Newtown Fish Toxicology Station will be listed in APPENDIX B.

In the words of Rachel Carson, author of *" Silent Spring"* -

" The aim of science is to discover and illuminate truth. And that, I take it, is the aim of literature, whether biography or history... It seems to me, then, that there can be a separate literature of science."

And also -

"A Who's Who of pesticides is therefore of concern to us all. I/we are going to live so intimately with these chemicals, eating and drinking them, taking them into the very marrow of our bones - we had better know something about their

nature and their power."

Rachel Carson was a friend of Aquatic Biologist Quentin H. Pickering. She and noted American Journalist Edward R. Morrow visited with Pickering in 1960 at the laboratory and corroborated with him about her future books. They also discussed the formation of the developing Newtown Fish Toxicology Laboratory.

Pickering was a coauthor in the later book, *"Beyond Silent Spring"* .

In chapter 4, we were warned, *"As aquatic biologists with interest in toxicology , we would abstract the message in Silent Spring as "While ridding the world of weeds, weevils and webworms/ Be careful of the fins, fur, and feathers."*

Why was the Village of Newtown, Ohio chosen to be the location of such a Toxicology Laboratory?

Actually, Newtown, Ohio was not the only site considered. Armond Lemke (Biologist) and James Dryer (Technician) were the initial workers at the Newtown Lab and made most of the decision on proper equipment needed for the various projects which would later be conducted. Dryer and Lemke were asked to examine other possible sites elsewhere. One site examined by Dryer was in West Virginia. This location had two streams on the property, one had extremely hard water, the other relatively soft water. The problem was that the water was not consistently available twelve months a year. The streams simply would dry up. The site itself was also not large enough for the building needs. We then chose Newtown, Ohio.

The main reasons for choosing the Newtown, Ohio location were:

1. Newtown, Ohio was less than five miles from the Robert A. Taft Sanitary Engineering Center, the home base at the time.
2. It would occupy land owned by the State of Ohio and was donated for aquatic toxicity research.
3. It had twenty-one fish ponds on location which allowed for adequate fish supplies for the research.
4. It had adequate and consistent water quality because of underground natural spring water. Along with the space and high quality spring water, large concrete water storage tanks were constructed on the hill behind the facility.
5. It was about 30 minutes drive from the Greater Cincinnati Airport, making shipment of fish, fish eggs, and other organisms to various areas of the country, to other countries, and even to the moon, possible.

Primary Responsibilities of Newtown Fislt Toxicology Station and it's Researchers

The National Environmental Research Laboratory's early role was the development of toxicity test methods and methods for assessing the biological integrity of the Nation' swaters.

The first incident which put the Newtown Laboratory *'on the map',* so to speak, was the following-

The Incident:

Beginning on November 18, 1963, a huge fish and other wildlife kill began happening on the lower Mississippi and Atchafalaya Rivers near the Gulf of Mexico. The Chief of the Division of Water Pollution Control, Louisiana State Wildlife and Fisheries Commission, asked the Public Health Services Division of Water Supply and Pollution Cont rol, of which the Newtown Laboratory was a part of, to help investigate the massive kills. Those kills occurred each year since 1960 during the fall and winter months and were particularly severe that year. A search for the cause of the kill had

proved inconclusively fr uitless . A number of theories had been advanced including cumulative pesticide poisoning and bacterial disease. Although evidence could be cited to support various theories, none of them had been substantiated with scientific proof.

In response to the request for technical assistance, the Division of Water Supply and Pollution Control sent a team of investigators to the lower Mississippi River area early in December 1963. These field investigations have been supported by work at the Robert A. Taft Sanitary Engineering Center, Cincinnati, and the Divisions Pesticide Pollution Laboratory, Atlanta. Three of the Divisions Branches have been involved in this study in cooperation with the State of Louisiana; Base Data, Basic and Applied Sciences, and Technical Services. The Division of Environmental Engineering and Food Protection has also participated in these investigations. Personnel of the Fish and Wildlife Service,U.S. Department of the Interior, have cooperated in investigating some of the relationships of the problem to fish diseases.

The Conclusion:

Scientists at the Robert A. Taft Sanitary Engineering Center, mainly Fisheries Biologist Dr. Donald I. Mount and Chemist Linda Vigor, after rigorous examination of the tissues ofdead and dyingfish using recently developed and highly sensitive analytical methods, revealed the presence of DDE, endrin and dieldren (all organochlorines), (Dichlorodiphenyltrichloroethane)DDT, and other synthetic organic chemicals. Endrin was consistently found in all tissue extracts examined. The fish killed were mainly channel catfish, drum, shad, and buffalo in fresh water and menhaden in brackish water.

Description of main testing procedures within the Newtown Lab.

Most of the in-house biological testing was conducted using water with the following characteristics;

It consisted of a mixture of naturally occurring Newtown. Ohio spring water and carbon-filtered de-ionized Cincinnati tap water. A hardness of200 partsper million (as Calcium carbonate) was maintained. Water was stored in a 100,000 gallon outdoor storage reservoir, from which it flowed, by gravity, into the building. Upon entry into the building it went into a self-leveling head-box where the temperature was adjusted and maintained at 20 degrees C.

Later, a field study was conducted on the Shayler Run Stream, in Clermont County, Ohio, to determine the effects of copper on the stream biota. One of the U.S. Environmental Protection Agency' s seminal studies compared a laboratory to field

predictions - *Validity of Laboratory Tests for Predicting Copper Toxicity in Streams.* Copper was added to the stream for 33 months to maintain a known concentration, a concentration of 120 ug/1 was expected to adversely affect some species of fish and not others. This natural stream received sewage effluent containing a variety of compounds known to affect acute copper toxicity. All but one abundant species offish in the stream and four of the five most abundant macroinvertebrates were adversely affected by exposure to copper. Direct effects on fish were death, avoidance, and restricted spawning. To determine the usefulness of laboratory toxicity tests when establishing water quality criteria for an aquatic ecosystem, acute and chronic tests with copper was conducted at the Newtown Fish Toxicology Station and on-site at Shayler Run with stream species and the fathead minnow. The acute toxicity of copper varied widely because of water quality variations in the stream. The chronic tests under estimated the in-stream toxicity by about two times because only the effects of copper on survival, growth, and reproduction were measured. Agreement between the predictions from laboratory toxicity tests and the observed effect was surprisingly close considering the measurement errors involved.

The Aquatic Biology Group also developed methods for field and la bora tory studies for use in detecting violations of water quality standards, evaluating the condition of surface waters and wastes, and measuring the effects of domestic and industrial wastes on aquatic life. Examples of work conducted by some of the highly motivated Research Aquatic Biologists, Chemists and Technicians and some of their major responsibilities are as follows;

1. Dr. Donald I. Mount was hired to establish the Newtown Fish Toxicology Station thus becoming the first Director. In the early 1960's, Dr. Mount developed a simplified diluter system for maintaining a series of constant concentrations of a material in flowing water. The system depended on water flows, metering cells, and venturi tubes to proportion volumes of water and toxicant to give desired concentrations. Construction required less than two days, and only readily available materials were needed. An injector for mixing pesticides in water was also developed.

   Under Dr. Mount's guidance, the effects of various organic and inorganic pesticides or other contaminants, which may produce abnormal early cancer or benign stage tumors were studied. Mainly brown bullhead (Ameirus nebulos us), fathead minnows *(Pimephales promelas),* bl uegill sunfish *(Lepomis macrochirus),* and goldfish *(Carassius auratus)* were used. These species a re common in la kes and streams in all areas of the United States.

2. The second Director was Dr. William A. Brungs who continued Mount's work.

Under Dr. Brungs, we acquired the first computer terminal which would be extremely beneficial in the years ahead. Brungs conducted a continuous-flow bioassay which was conducted for 10 months to determine the chronic effect of zinc on fathead minnows (Pimephales promelas Rafinesque). Fish production, as based on survival, growth, and reproduction, was investigated. Reproduction by the test fish was almost totally inhibited at zinc concentrations that had no effect on su rviva l, growth, or maturation of these same fish. At these same concentrations there was also no effect on survival of control eggs and fry. Brungs also conducted acute and chronic toxicity of copper to the fathead minnow in a surface water of variable quality.

3. William Horning's primary position, besides being an Aquatic Biologist and the Third Director of the Lab, involved the development of biological aquatic toxicity tests to determine toxicity reduction by municipal and industrial wastewater treatment processes.

4. James M. Lazorchak became the Newtown Laboratory Director in 1988. Under his direction the Newtown Fish Toxicology Laboratory was essentially ended as such, and in turn was retooled to become more of an ecological lab doing studies with earthworms, etc.. He conducted or participated in Regional EMAP studies in the Mid Atlantic Integrated Assessment (MAIA), Mid Atlantic Highlands **(MAHA),** Rocky Mountain Ecoregion and Large Rivers (Upper Mississippi, Ohio and Missouri Rivers). Newtown scientists also conducted field assessment surveys of mine impacted streams in Colorado at superfund sites in the Eagle, Clear Creek and the Upper Arkansas River watersheds. Newtown Staff also assisted Region 9 at the superfund site in Clear Lake assessing the fate of contaminants in sediments. They conducted local scale watershed studies in the Little Miami Watershed and collected and analyzed fish, macroinver tebr ates, and periphyton. They developed an assessment of condition of various tributaries to the Little Miami River, a national and state scenic river. In 1994, the Newtown building was closed as a government facility. Lazorchak was given a bronze medal for closing the Laboratory. After closing of the Newtown Lab, most of its functions were transferred to the Andrew W. Breidenbach Environmental Research Center at 26 West Martin Luther King Drive. The continued work will bediscussed later in this document.

5. The chemical analysis procedures dealing with recovery of heavy metals, such as copper, zinc, cadmium , and chromium, and sever al organic pesticides were initially performed by Chemist Linda Vigor, followed by Charles Stephan and later by Greg Marsh. They used various colorimetric, polarographic, spectrographic and other methods as deemed necessary.

6. Quentin Pickering, an Aquatic Biologist, whose primary area of research was the effects of fish toxicity on water quality criteria for freshwater fish. His research was in the field of biological methods standardization to evaluate the chronic toxicity of complex wastewaters to fish. As mentioned earlier, he did considerable work with Rachel Carson.

7. Timothy Neiheisel, another Aquatic Biologist, was involved in acute, subacute, chronic and sub-chronic toxicity testing of industrial and municipal wastewaters. More recent work included cooperation with, and the support of, projects of the Industrial Environmental Research Laboratory and the Municipal Environmental Research Laboratory at the U.S. Environmental Protection Agency's (T&E) Test and Evaluation Facility in Cincinnati, Ohio. This research involves monitoring and technical direction of toxicity reduction studies using seven-day *Ceriodap/111ia* chronic and fathead minnow *(Pimephales Promelas)* larval, growth and survival tests to evaluate the performance of wastewater treatment systems, and to evaluate and standardize the tests and procedures for conducting such studies.

8. For a short time, Dr. Eugene Surber, Aquatic Biologist, was part of the group. Surber was the creator of the Surber sampler which was used for collecting biota samples from rivers, lakes and streams. His sampler was used for some of the research.

9. Armond Lemke, Aquatic Biologist, conducted much of the field collection and investigations involved in conducting static and flow-thru bioassays. Early on, Lemke and James Dryer were assigned to travel to various states to determine that the NPDES *(National Pollutant Discharge Elimination System)* data were being properly collected by that particular State.

10. James Dryer, Biological Laboratory Technician, as part of the QA/QC work, conducted hundreds of static bioassays using known compounds in conjunction with unknown materials used by various researchers. Dryer, developed the Agency's first Bulletin Board System which allowed data and statistical procedures, such as moving-average angle, probit analysis, and other standardized statistical procedures to be shared with scientists throughout the free world. Dryer also designed and wrote the statistical procedures using FORTRAN *(Formula Translation)* and BASIC *(Begi1111ers All Purpose Symbolic /11structio11 Code)* computer languages.

11. About this time, on the Great Miami River, (northwest of Cincinnati, Ohio), near Hamilton, Ohio, the Newtown Fish Toxicology group was notified about a large

number of fish and other freshwater organisms being found dead or dying along the river. At the scene dead and dying organisms were collected. Because of careful scientific examining and chemical testing, the staff found the root cause and the offending company/factory. Justice was served after a lengthy court battle.

12. Algal toxicological work was conducted by Aquatic Biologist Ernest Robinson, whose work involved conducting static bioassays *usingLemna* and *Clt/orococcum* to determine the toxic effects of selected reference toxicants. The test methods and the results were evaluated and validated so that there was reasonable assurance that representative and accurate measurements of the toxicity of the reference toxicants were achieved by the methods. The final goal was to have these test procedures used as USEPA standards for measuring the effect of complex and variable wastes on aquatic organisms.

13. Phil Lewis, Aquatic Biologist, was involved in the toxicological study of various micro Crustacea including , but not limited to, water fleas - i.e. *Daplmia magna* and *Ceriodaplmia.* His duties included development, evaluation and standardization of methods for invertebrate bioassays, and for the collection of invertebrate samples for intensive surveys of the effect of pollutants on aquatic life in receiving waters. He provided technical advice on field and laboratory methods for invertebrates to other USEPA, Federal and state water and wastewater monitoring programs and on invertebrate effluent toxicity tests and related methodology.

14. Don Klemm, an Aquatic Biologist, was involved in developing, evaluating and standardizing culture and bioassay methods for measuring acute and chronic toxicity of effluents and surface water invertebrates and sea urchins.

15. Roger B. Yeardley, Laura C. Gast, and other Technicians, under Lazorchak, conducted a number of earthworm studies investigating avoidance of some pollutants. One of their papers titled *"The Potential of an Earthworm Avoidance Test/or Evaluation of Hazardous Waste Sites"* describes it as follows:
'An earthworm avoidance test has potential advantages for use in evaluation of hazardous waste sites. Because organisms often exhibit behavioral responses at lower levels of stress than those that acute toxicity tests are able to detect, avoidance tests could provide sensitivity to hazardous materials. Avoidance is all ecologically relative endpoint that neither acute nor sub/etha/ tests measure. Avoidance can potentially indicate subletlta/ stress in a short period of time testing is easily done in a soil matrix, and an avoidance test has a potential for special applications for soil testing.'

As we discussed earlier, the Aquatic Biology and Ecotoxicology study that started and conducted at the Newtown Fish Toxicology Laboratory continues and are still impacting science throughout the world. All of the culture and testing facilities have been moved to the Andrew W. Breidenbach Environmental Research Center Animal and Aquatic Research Facility. The Cincinnati animal research program uses terrestrial and aquatic organisms to address research topics such as measuring environmental exposures and risks, and evaluating risk reduction techniques. The animal research program is accredited by the Association for Accreditation and Assessment for Laboratory Animal Care (AAALAC) and is the sole AAALAC-accredited aquatic facility within the USEPA. This program supports the Office of Research and Developments'sSafe and Sustainable Water Resources, Sustainable and Healthy Communities, and Chemical Safety for Sustainability Research Programs. It also supports collaborative efforts with EPA's Regions and some Office of Water Clean Water Act programs (e.g., Sections 308 and 402 NPDES, compliance toxicity testing, TMDL projects, and effluent guidelines).

Approximately one half of the facility is dedicated to aquatic vertebrate and invertebrate culture and testing. One of the testing rooms has the capability of running flow-through exposures and automated renewal sediment tests. Few U.S. labs have these capabilities. All rooms share a water treatment system which supplies both culture water on a constant flow-through basis (i.e., 24 hours a day) and test water that has been chemically characterized.

Several fish and invertebrate breeding lines are maintained in the aquatic facility, including the Fathead minnow *(Pimphales promelas),* Zebra Fish *(Danio rerio),* a sediment-dwelling midge *(Chironomus dilutus)* and amphipod *(Hyalella azteca),* zooplankton *(Ceriodaplmia dubia* and *Daplmia magna),* and a parthenogenic mayfly *(Neoc/oeon triangul ifer).* These research toxicity test organisms are internationally recognized and used in USEPA regulatory programs such as Whole Effluent Toxicity (WET) and contaminated sediment testing because of their required high quality of health due to the rigorous culture requirements of the USEPA standardized methods. These models have been maintained for over 20 years at this facility.

The Aquatic Research Facility also supports studies conducted at the USEPA's Experiment Stream Facility in Milford Ohio.The Experimental Stream Facility (ESF) is one of only a handful of research facilities in the United States designed to conduct small stream research. The facility has 16 stream mesocosms (experimental enclosures designed to approximate natural conditions) in which environmental factors can be manipulated. This allows researchers to study how

pollutants interact with important characteristics of stream habitat. ESFstudies are designed to gain information on both watershed management and the impact of conta mina nts. The Aquatic Research Facility supplies and conducts exposures collaboratively using fathead minnows in the streams to assess fecundity effects. In addition, amphipods and mayflies are also tested in ex situ exposure chambers for I to 4 weeks of exposures. In addition, fatheads that are exposed at ESF have also been analysed for Microcystin tissue contaminations.

These models are used to study molecular and physiological changes induced by stressors such as pesticides, endocrine disrupting chemicals, phar maceutica ls, and contaminated sediments in order to:

I· look at the infectivity of pathogens in embryonic stages of fish as a mammalian model,
2· develop DNA barcodes to identify species and their response to environmental stressors,
3· use genetic and genomic indicators to determine the integrity of aquatic ecosystems, and
4. detect and monitor invasive species.

The other half of the facility is dedicated to research using terrestrial animal models including rodents and birds. This facility is unusual in that it allows research with live infectious micro orga nis ms. Animals have been used to assess infectivity and virulence of pathogens and other opportunistic micr oorga nisms, characterize exposure risks, develop antibodies, produce stock pathogens *(Giardia duodena/is* and *Cryptosporidium parvum),* and evaluate disinfection effectiveness. The ability to safely conduct aerosol exposures (ie *Legio11ella)* in the Madison chamber is unique to ORD and to EPA.

Beside the shortened version of the work of the above staff, well over 200 documents, all peer-reviewed, were published. To access many of these documents, please refer to **APPENDIX A.**

The Newtown staff also conducted tours of the facilities to hundreds of high school and college students and their instr uctors/pr ofessors introducing them to various aspects of biological marine and fresh-water research and statistical possibilities.They also taught classes to high school and college teachers/professors dealing with the work of the research. Some of the Professors who participated in the courses took the written mate rial back with them and with this material taught their students. The staff worked with many other visiting scientists from many second and third-world countries introducing them to ways to make their rivers and streams safer and cleaner. Another instructor was Sr. Paula Gonzalas, from the College of Mount Saint Joseph located near Cincinnati, who volunteered her vacations for a number of years. She was an

inspiration to each of us as she wanted to be ' one of the guys' as she carefully tucked the back of her habit into the front of her sash, put on a pair of fishing waders and proceeded to collect samples with us in rivers and st reams.

The Newtown scientists were highly involved in attending various symposia such as SETAC (Society of Envi ronmental Toxicology and Chemistry) and the North American Benthological Society.

Unfortunately, three of the researchers passed away at an early age. Their information will be found in APPENDIX E.

The continued success of the Newtown Group was due to the total teamwork of more than eighty dedicated team players and because of this, the Newtown legacy will live on far into the future.

APPENDIX A

There are essentially two methods for obtaining Newtown Fish Toxicology documents. The first method is using NSCEP. The second is by going to the Google search line.

A. Standard Operation Procedure (SOP) for locating Publications written by Newtown Team members. These may be found on EPA' s National Service Center Environmental Publications(NSCEP).

1. Ways to Search and Browse National Service Center Environmental Publications

2. Go to https://www.epa.gov/nscep

3. Go to 'Search Publications' and type in researchers full name or title name.

Example 1, to find the Mount Proportional Diluter, go to the above and type in Donald I. Mount, scroll down his many publications and you will find (note, you must use the persons full name).

'Manual For Construction And Operation Of Toxicity-testing Proportional Diluter'

Open the document and follow online instructions.

Example 2. For the Shaylor Run study called,

' Validityof laboratory tests for predicting copper toxicity in streams'

B. Go into the Google search line on your computer.

1. Type in Newtown Fish Toxicology - followed by the researchers na me.

i.e. Newtown Fish Toxicology Brungs. You will pull up numerous publications written by Dr. Brungs.

APPENDIX B
EMPLOYEES
NEWTOWN FISH TOXICOLOGY STATION
3411 Church Street
Newtown, Ohio 45244
1960 to 1994

DIRECTORS :

Clarence Tarzwell, Chief of Aquatic Biology Section and instrumental in establishing the Newtown Lab
Robert Booth, Environmental Monitoring Support Laboratory Director
Donald I. Mount, First Newtown Fish Toxicology Director and later Director Mid-Continental Ecology Division, Environmental Research Laboratory, Duluth, MN
William A. Brungs, Second Newtown Fish Toxicology Director
William B. Horning, Third Newtown Fish Toxicology Director Beginning 1971
James Lazorchak, Last Newtown Fish Toxicology Director 1988 to 1994

AQUATIC BIOLOGISTS :

Donald I. Mount
William B. Horning
Quentin H. Pickering
Armond Lemke
Timothy W. Neiheisel
Croswell (Brudge) Henderson
William A. Brungs
Gene Surber
Jack Geekier
Ernest L. Robinson
William Irwin
Tom Maloney
Jerry Hubschmann
John Ward
Tom Thatcher
Dennis McMullan
Larry Lobring
John Eaton
Gary Cummins, temporary
Don Klemm
Phil Lewis
James Lazorchak
Steve Hedtke
Ben MCFarland
Frank McCormick
Michael Griffith
Anett Tribitz
Melba Hirth
Lori Herrin
William Thoeny
Susanna DeCelles
Roger Yeardley
John Wirtz
Sandy Brewer
Joe Flotermersch
Brian Hill
Darren Scopel
Susanna DeCelles

Sr. Paula Gonzalas - Honorable Mention

SECRETARIES :

Marge Schulte
Rosemary Swantack
Debra Hall
Betty Goldsberry
Angie Bridges
Cordelia 'Dee' Nowell
Sandra Smith Dryer

CHEMISTS :

Charles Stephan
Wallace Gilliam
Linda Vigor
Wendy Nielson
Dennis Seegar
Greg Marsh
Dennis Lynch
Julie Ayres
Mark Millson

TECHNICIANS :

James N. Dryer
Marion Gast
Dave Henderson
William Vigor
Mark Smith
Chris Hall
Dave Votaw
Corlis West
Glen Mills
Herman Haring
William Haucke
William Asbury
Rhonda Markhum
Ann Kneipp
Kelly Winkler
Lori Herrin
Laura Gast
Debra Jones
Vivian Asbury
Melba Young
Carol German, temporary

ASSISTANTS :

Russ Creager
Elsworth "Ozzie" Lukemire
Kermit Figart
Robert Kneipp
Bernie Fish
Clara Lemon

APPENDIX C

PROGRAM - DEDIC ATIO N o f a $50 0,000 ADD IT IO N
NEWTOWN FISH TOXICO LOG Y ST AT IO N
34 11 Chu rc h Stree t
New town, Ohio 45244
SEPTEMBER 19, 1976
CEREMONIES BEGIN 2:30 PM

Pledge ofAllegiance	Robert Turpin Fischer Mayor Newtown , Ohio
National Anthem	Richard D. Jaeggi
NFTS - Where We've Been and Where We're Going	William Bliss Horn ing II
Presentation of Special Guests	Dr. Donald I. Mount Director Environmental Research Laboratory Duluth, Minnesota
Introduction of Keynote Speaker	Willis D. Gradison Jr. 1st Congressional District Ohio
Zoo - The Last Ark	Edward J. Maruska Director Cincinnati, Ohio
Closing Remarks	William Bliss Horn ing JI

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ADMINISTRATION

Russell E. Train
Administrator

Washington D.C.

Dr. William It Talley
Assistant Administrator
Office of Research and Development

Washington, D.C.

Dr. Delbert S. Barth
Deputy Assista nt Administrator
Washmgton, D.C.

Office of Health and Ecology

Donald I. Mount
Environment ResearchLaboratory
Director

Duluth, Minnesota

William B. Horning II
Chief
Newtown Fish Toxicology Sta tion

Newtow n, Ohio

NEWTOWN FISH TOXICOLOGY STATION

William B. Hornin_g II
C hief and Resear cfi Aquatic Biologist

Timothy W. Neiheisel
Research Aquatic Biologist

Quentin H. Pickering
Research Aquatic Biologist

Ernest L. Robinson
Research Aquatic Biologist

Mark Milson
Chemist

Marion H. Gast
Biological Technician

James Dryer
Biological Technician

Russell Creager
Maintenance Mechanic

Rosemary Swaota ck
Admioisfrative Technician

Gary Cummins
Biologis t (temporary)

Carol German
Biologist (temporary)

APPENDI X D

The Beer Cellar

Normally, at least weekly, the researchers would go from the Robert A. Taft location to the Newtown property to collect spring water from a natural spring basin and haul it back to the Taft building for use in various studies. There was a very old beer cellar nearby which would eventually become the new addition of the Newtown Fish Toxicology Sta tion. Why would there be a beer cellar in the middle of nowhere?

One must first consider the location of the Newtown, Ohio area in the 1800's as compared to today. Today, with reasonable traffic you can drive to downtown Cincinnati in thirty minute or less. Not so back then. Newtown was an eight hour trip to downtown Cincinnati due to muddy dirt roads and transportation of horses and carriages.

By the way, Newtow n, Ohio did not exist as a village at that time. It was previously known by various names such as Mercer, Mercers Burg, Mercersburg, etc.. Mercersburg was named after Captain Aaron Mercer who had a stockade on land where the ponds are now located. When the stockade was rebuilt after being destroyed by Indians, it was then renamed the New Town. Newtown became a village in 1792.

Since it would take about eight hours to get to Cincinnati, the Newtown Hotel was built at the corner of the present Church and Main Streets. Directly behind the hotel, where the previously discussed fish ponds are now located , was farmland needed to supply fresh food for the hotel guests. These travelers wanted good beer to quench their thirst. Thus, a brewery was constructed on the upper acreage to satisfy travelers thirst.

This beer cellar was located adjacent to the Newtown driveway. To enter, one had to climb down about eight sandstone steps. You then entered a large cavern, consisting of an arched room about fifty feet in length and about twenty feet tall. At the far end one would turn right and there was a lesser sized arched room. This cellar gave us ample storage room for the biological samples.

APPENDIX E

Aerial View of the Newtown Fish Toxicology Station

Fish Ponds

Concrete
100,000 gallon
Water
Storage
Tanks

Newtown Fish Toxicology Station

3411 Church Street

APPENDIX F

A tribute to the Researchers who passed away

Jack Geekier, Marion Gast, and Mark Smith were extremely knowledgeable and dedicated researchers at the Newtown Lab. All three passed by massive heart attacks.

Also special recognition to Sr. Paula Gonzalas who volunteered her vacations to work with the crew so that, first hand, she could learn the procedures and would be able to convey this knowledge to her students at the Mount St Joseph College near Cincinnati, Ohio. She was known as the *solar nun* because she converted a chicken coop into her private residence by installing solar panels on the coop which, in turn, kept her warm or cool throughout the year. She was known as a very strong local environmentalist, activist and educator.

APPENDIX G

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