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Effects of Temperature on the Toxicity to the Aquatic Biota of Waste Discharges - A Compilation of the Literature

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EFFECTS OF TEMPERATURE ON THE TOXICITY TO THE AQUATIC BIOTA OF WASTE DISCHARGES–A COMPILATION OF THE LITERATURE

by

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ABSTRACT

An extensive compilation and general evaluation of the literature is presented which describes the temperature interaction with toxicity. Recent literature is summarized and made accessible along with a few generalized relationships such that researchers may design studies in a manner that will increase the utility of their results. A detailed indexing system is employed which makes the information contained in the report accessible by author, toxicant. and test organism. Summary tables of the most pertinent literature are also presented for easy subject retrieval.

It was concluded that very little uniformity in experimental design is found between experiments on temperature-toxicity relationships, and a generalized summary of the results presented in the literature is essentially impossible because of the inconsistencies in experimental designs.

The utilization of standard bioassay procedures is highly recommended, and these procedures should be applied to experimental designs which allow the estimation of parameters related to the theoretical effects of temperature.

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INTRODUCTION

The production of thermal discharges

The Edison Electric Institute and the Federal Power Commission have estimated that the energy requirements in the United States will increase from 728 billion kilowatt hours in 1958 to 4,260 billion kilowatt hours in the year 2000, an increase of nearly 6 times (1257). Therefore, the discharge of heat in streams, lakes, and estuaries from electric power production will become an even more important factor in the total thermal pollution problem (103, 770, 781, 1258, 1259, 1260). With such a large use increase, thermal loadings will be compounded significantly in the United States and it will require significant technological advance to reduce the heat wastage per kilowatt hour of energy generated. Therefore, it is essential that an engineering evaluation of thermal pollution be considered in every water resources analysis.

If such an engineering evaluation is to be made, it is essential that certain criteria be developed.

Temperature and toxicity

One area in which there is an acute shortage of data is the effect of thermal loadings on the toxicity of waste discharges. At the present time many lakes and streams receive discharges from various types of waste treatment facilities. As more power generating facilities are constructed along these receiving streams there will result an increase in temperature, i.e. thermal enrichment. The cumulative effect of this increase in temperature on the river and lake ecosystems must be defined Physical, chemical, and ecological effects of increasing thermal loadings have been reported in the literature However, little effort has been devoted to relating and interpreting these data with reference to specific problems of the effects of thermal enrichment on toxicity or the potential toxic effect of treatment plant effluent discharges.

Effects of thermal enrichment

The effects of such aqueous cooling systems has been to increase the thermal load to natural aquatic ecosystems and thus increase the rate of change of water temperatures, the seasonal range, and the mean temperature of the water. Although extensive studies on direct thermal effects on aquatic communities have been performed (see reviews in 1261, 1271), there is the need to identify the temperature role in toxicity and possibly other water pollution factors. Also there would be significant thermal effects on toxicity in general and on the specific toxic materials in aquatic animals and plants.

Thermal pollution is a problem in itself as is the presence of toxic materials in aquatic environments. It is likely that the combination of changes in thermal status coupled with the effects of toxic materials will cause a multiplicative rather than additive increase in deleterious effects on aquatic biota.

Objectives of this research

The overall purpose of this study was to define the effects of temperature change on the aquatic biota and the interaction of temperature change with toxic wastes and those effects on aquatic biota. Laboratory work will be presented elsewhere (1287, 1288, 1289) while this report will deal with the extensive literature which was surveyed to provide a basis for the overall consideration of temperature interaction with toxicity.

The specific objectives of this report are 1) to summarize and make accessible the major portion of the recent literature concerning the interaction of temperature and toxicity, 2) to define some generalized relationships which may be of value to specific researchers in designing studies on this subject and which would increase the utility of their research, and 3) to index the recent literature as appropriate to increase its usefulness to researchers in the field of thermal pollution.

THERMAL EFFECTS ON BIOLOGICAL SYSTEMS

Overview of temperature interactions

Generally, one can assume that the effects of changes of temperature on biological systems will approximate the order of magnitude effects of temperature on chemical systems. In chemical systems rates generally increase by a factor of two or more for a ten degree temperature increase; in physical systems the rate change increases by a factor of only about 1.1 to 1.2.

Furthermore, biological systems can be subdivided into areas of interaction; e.g. biochemical reactions, cellular reactions, organismal responses, population and community responses, ecosystem responses, and cultural uses, all providing an increasing complexity of possible occurrences. For example, increasing temperature will cause an increase in reaction rate for enzymes but may lead to a population explosion among mosquitoes, avoidance reactions in fish, and changes in recreational and other cultural habits by the human population. The impact of a rising or falling, high or low temperature upon our aquatic environment is probably involved in determining the type of aquatic species present, regulating activity of organisms, and in the stimulation or suppression of growth, spawning, metamorphosis, and migration. With an increasing temperature the rates of body metabolism and activity increases; whereas, a change toward a cold habitat will suppress development. It has also been observed that a too rapid change in temperature often results in fatality to members of the aquatic community.

Thus, a consideration of thermal effects on aquatic ecosystems must include 1) the mean temperature, 2) the daily, seasonal, and other time variant patterns of temperature change, 3) the rates of temperature change, 4) the effects on communities of adaptation by organisms to temperature change, and 5) the effects of sudden inputs of temperature through human activities on the time, space, and ecological relationships.

Biochemical reaction rates

Chemical reaction rates are dependent on the concentration and kinds of reactants and products present for a given temperature. Temperature has a direct effect on physical and chemical processes by increasing the kinetic energy of the molecules Arrhenius postulated that not all molecules in a system are capable of reaction, i.e. possess enough kinetic energy to complete a particular process. Physical processes are not affected too much by such increases in molecular motion. For example, molecular diffusion only increases on the order of 10 percent for a 10°C rise in temperature Rates of chemical reactions increase 2-4 times with an increase of 10°C in temperature and this can be described by the Arrhenius equation:

$$\ln k = B - \frac{E_a}{RT}$$

where k is the reaction rate, B a constant related to the frequency of collisions between reactants, R is the gas constant (1.98 cal/mole degree Kelvin), T is the absolute temperature, and E_a is the activation energy (calories/mole) or the mean energy required for reactant molecules to complete a reaction.

A common expression related to the Arrhenius concept is Q_{10}, the relative change in a rate function (k) over a 10°C temperature increase in a specified temperature (T) range. Q_{10}, a temperature coefficient, is illustrated in the following equation

$$Q_{10} = \frac{k_{T+10}}{k_T}$$

where k_T equals the reaction rate of a process and k_{T+10} is the reaction rate with a 10°C increase in temperature.

An equilibrium between inactive and active molecules can be described

$$\text{inactive} \underset{k_2}{\overset{k_1}{\rightleftarrows}} \text{active}$$

which has an equilibrium constant $[K = (k_1/k_2)]$ which is related to temperature by the van't Hoff equation:

$$\ln K = C - \frac{\Delta H}{RT}$$

where C is an integration constant and ΔH is the heat of reaction (calories/mole).

It is obvious that the chemical-biochemical equilibria and the kinetics of certain biological reactions will be affected greatly by small temperature changes.

Cellular and organismal responses

Investigators of responses to temperature by reactants other than at the chemical and biochemical level have obtained good results by assuming that the Arrhenius, Q_{10}, and van't Hoff relationships apply to these more complex systems. This is reasonable when one considers the limiting reaction of a sequence of reactions to remain the same as the temperature increases. The application to organism response of kinetic laws applicable at the molecular level can be thought of as an extension of the allometric law. This has been reasonably successful with other formulations such as applying the Michaelis-Menten enzyme relationship to utilization of substrates and nutrients by microbial populations.

Researchers should be careful to design their experiments to make measurements of these relationships not only to increase the generality of the application of their data but to determine the validity of applying such relationships to more complex biological systems.

As an extension of the application of these relations to organisms, heat death of cells occurs when critical enzyme systems are inactivated. A concept of the energy of inactivation can be derived from enzyme kinetics. Normally the activation energy of most biological reactions is in the range of 15,000 - 25,000 calories/mole while heat inactivation is on the order of 40,000 to 100,000 calories/mole.

Generally, when discussing thermal effects in aquatic ecosystems, it is necessary to distinguish between 1) acute affects which may be due to heat death or to other enzymatic interactions with temperature increases (or decreases) and 2) chronic effects which invariably are due to enzymatic effects, i.e. changes in rates of reaction These changes in reaction rates result in successional changes as organisms change in their ability to compete and to production changes caused by growth rate changes.

Generally, one would expect that as temperature increases for a particular organism, reaction rates increase and thus growth rates, activity, and maintenance of cellular integrity and metabolism would also increase in an absolute and relative sense. Stresses on such a system would tend to perturb such a system more because of the relatively greater maintenance cost. Therefore, all other things being equal, greater toxicity would be expected as the temperature of the environment for a particular organism increases. This is complicated by other interrelationships.

Temperature effects on response of organisms to different toxicants

Depending on the type of toxicant being used, an increase in temperature can increase the toxicity of a compound or decrease its effectiveness (Table 1). For example, a concentration of 8.0 ppm of zinc was required to obtain a 50 percent mortality over 24 hours in bluegills maintained in soft water at 15°C When the temperature was increased to 25°C the required dosage decreased and only 6.8 ppm was needed for a 24 hour TL_M(1130). The authors concluded that this difference was not significant; thus, temperature apparently had little effect on toxicity. However, in another study, using the same test species and changing the toxicant to *o*-chlorophenol, the effectiveness of the compound decreased with increasing temperature. When *o*-chlorophenol was used at 20°C only 8.2 ppm was necessary for a 24 hour TL_M (1163). After the temperature was increased to 25°C, the toxicant concentration also increased and 11.31 ppm was needed for a 24 hour TL_M(1252). However, in most of the other cases shown in Table 1, temperature increase resulted in lower concentrations of toxicant necessary to produce the particular response as would be expected.

Many problems are associated with the bioassay of specific organisms using specific toxicants as affected by thermal enrichment (temperature increase). Temperature affects solubility of the toxicant (van't Hoff equation) as well as response of the organism and this may account for the differences in toxicity-temperature relationships shown in Table 1. An area of experimentation which needs further work is whether temperature in fact does increase the toxicity of a compound as would be expected on purely theoretical grounds.

Another problem with studies at the organism level is that eurythermal test organisms are often used in temperature/toxicity studies. The broader temperature range makes the data more applicable to more diverse situations. However, eurythermal fish may prove to be hardier than stenothermal fish. For example, it takes 526 ppm of Rhodamine-B to kill half of a channel catfish population over a 96 hour period at 12°C (288). But only 217 ppm (96 hour LC_{50} at 12°C) of the same toxicant is needed when using rainbow trout (288).

General effects of temperature on the non-biological system

When heavy metals and organic pesticides are present, temperature plays more than just a passive role. Generally, as the water is warmed, chemical and biological reactions occur much more rapidly. The effect of a toxicant is apparently more pronounced at higher temperatures than at lower ones. Since gas solubility varies inversely with temperature, gases are present in lower concentrations at higher temperatures. Therefore, care must be taken to insure that the death of a particular species is due to the toxicant and not to the absence of certain gases, i.e., death resulting from oxygen deficiency (502).

These relationships can be complex; gases are more soluble at low temperatures and the solubility of certain heavy metals is a function of their oxidation state; thus oxygen concentrations (and therefore temperature) can play an important role in regulating their solubility. Further, calcium carbonates and other precipitates and complexes vary in their solubility with temperature. Thus, for example, co-precipitation of heavy metals by calcium precipitation could be affected by temperature.

Table 1. The effect of temperature on bioassay response to toxicants affecting the same organisms.

Temperature° C	Organism	Toxicant	Response Parameter	Ref.
20	Bluegill[a]	*o*-chlorophenol	24 hr TL_M = 8.2 mg/l	1163
25	Bluegill[a]	*o*-chlorophenol	24 hr TL_M = 11.31 mg/l	1252
20	Bluegill[a]	*o*-chlorophenol	48 hr TL_M = 8.1 mg/l	1163
25	Bluegill[a]	*o*-chlorophenol	48 hr TL_M = 10.59 mg/l	1252
16	Bluegill Fingerlings[a]	LAS (DO = 8.2)	24 hr TL_M = 3.1 mg/l	1076
25	Bluegill Fingerlings[a]	LAS (DO = 7.6)	24 hr TL_M = 3.0 mg/l	1076
16	Bluegill Fingerlings[a]	LAS (DO = 8.2)	48 hr TL_M = 2.4 mg/l	1076
25	Bluegill Fingerlings[a]	LAS (DO = 7.6)	48 hr TL_M = 3.0 mg/l	1076
8.5	Goldfish[b]	"Sinking" Toxaphene	[d] LC_{50} = 0.029 - 0.066	871
20	Goldfish[b]	"Sinking" Toxaphene	[d] LC_{50} = 0.006 - 0.010	871
8.5	Goldfish[b]	"Floating" Toxaphene	[d] LC_{50} = 0.016 - 0.040	871
20	Goldfish[b]	"Floating" Toxaphene	[d] LC_{50} = 0.000 - 0.024	871
15	Bluegill[a]	Zinc in soft water	24 hr TL_M = 8.0 mg/l	1130
25	Bluegill[a]	Zinc in soft water	24 hr TL_M = 6.8 mg/l	1130
15	Bluegill[a]	Zinc in soft water	48 hr TL_M = 6.1 mg/l	1130
25	Bluegill[a]	Zinc in soft water	48 hr TL_M = 5.5 mg/l	1130
15	Bluegill[a]	Zinc in soft water	96 hr TL_M = 6.4 mg/l	1130
25	Bluegill[a]	Zinc in soft water	96 hr TL_M = 5.5 mg/l	1130
15	Fathead Minnows[c]	Zinc in soft water	24 hr TL_M = 3.2 mg/l	1130
25	Fathead Minnows[c]	Zinc in soft water	24 hr TL_M = 0.89 mg/l	1130
15	Fathead Minnows[c]	Zinc in soft water	48 hr TL_M = 2.6 mg/l	1130
25	Fathead Minnows[c]	Zinc in soft water	48 hr TL_M = 0.77 mg/l	1130
15	Fathead Minnows[c]	Zinc in soft water	96 hr TL_M = 2.6 mg/l	1130
25	Fathead Minnows[c]	Zinc in soft water	96 hr TL_M = 0.77 mg/l	1130

[a] *Lepomis macrochirus*

[b] *Carassius auratus*

[c] *Pimephales promelas*

[d] LC_{50} time of exposure not specified. Values are 95 percent confidence limits.

DESCRIPTION OF THE LITERATURE REVIEW

Justification of study

The magnitude of the literature on thermal effects is illustrated by the bibliography prepared by the American Society of Civil Engineers Committee on thermal pollution which contains 878 references, and this is not an exhaustive review (1261). In a preliminary review of these references, only cursory mention is given to the relationship between toxicity and temperature effects.

Unfortunately little has been done in relating changes in toxicity with temperature. For example, such a relationship has not been mentioned in Water Quality Criteria published in 1968 (1271).

The toxicity of municipal and industrial effluents has been demonstrated in many environmental studies; however, all of these data were obtained at temperatures approximating the mean temperature of the study area (1264, 1265, 1266, 1267, 1272, 1273, 1274). Thus, attempts to combine such data and establish relationships between physico-chemical and biological factors has not been possible.

The effects of temperature on all levels of the aquatic biota are well documented in the scientific literature. Data which indicate maximum temperatures, optimum temperature ranges, maximum permissible temperature changes, acclimation temperatures, etc., are available for a wide variety of organisms (1275, 1276, 1277, 1278). However, there is no mention of the relationship between toxicity of waste discharges and increasing temperature.

Literature sources and information retrieval

Purpose. The accumulation of a mass of published material, necessary to the functioning of any department or laboratory involved in research, eventually requires the development of some sort of reference system, so that the material may be available to users. The type of system employed and the sophistication of such a system would reflect both the immediate and long-term purposes for which it would be used.

Characteristics of reference systems. One of the primary considerations is that a reliable reference system should be easily operated by any of its potential users. The system must not be designed to be a mystery to all but its inventor.

If the system must handle a large volume of material, it should work on a cross-reference basis. The articles should be catalogued according to a topical or author approach. The user should be able to find the articles available by a given author as well as those in a given area of the field.

The system should be dynamic, capable of expanding indefinitely with every addition of new material. It should be constructed so that there would always be space for more additions within each division, and it should be capable of being made more complex and sophisticated as the need arises. While a simple system may be adequate for the needs of a small department or laboratory or to catalog a limited number of articles, eventually, as the institution grows and as more and more articles in the field of interest are published, it will become necessary for the reference system to accommodate a new complexity of organization.

Temperature-toxicity literature. This section describes a system used to encompass the flood of articles dealing with temperature-toxicity studies which was of interest to the Utah Water Research Laboratory at Utah State University, Logan, Utah.

The system adopted was a fairly simple cross-reference system involving the use of a card index, loose-leaf bound abstracts, reprints of the original articles, and tabled information from articles. The cards in the index are listed alphabetically, by author's last name. Also a code number (numbered primarily in order of receipt) was listed in the upper right-hand corner corresponding to the particular article or abstract. The articles and abstracts were also listeed alphabetically by author in loose-leaf binders.

The tabled information was categorized by subject topics according to the toxicant tested and then by the species of organism involved. The tables were identified as to the articles they were taken from by the aforementioned code number.

All of the articles, those abstracted as well as those where information had been tabled, were assigned a subject heading according to the information contained. The articles were cataloged in five main sections: A. Thermal Pollution, B. Effects of Thermal Pollution, C. Control of Thermal Pollution, D. Development of Standards, and E. Biological Aspects. Each section was divided into numerous subheadings.

Thus each article was indexed under the author's name and by its pertinent subject or subjects. Tables had an additional subject classification by toxicant and organism. The extra subject enables users to locate tables relevant to studies on a particular toxicant or organism. As most of the articles were included in the tables for easy accessibility, this system enables the users to find them quickly. This addition to the basic index system accommodated it to the specific needs of the Utah Water Research Laboratory.

This report contains the numerical listing of all references, abstracts, and articles contained in the card files of the Utah Water Research Laboratory. These are keyed to the index and to the summary tables contained herein. Users interested in abstracts or articles *which are available in these files* may send in a request by reference number for xerox copies of any information. Charges for such service will be ten cents per page (price subject to change as needed to meet expenses).

The summarization and cross indexing of literature

The four appendices reported herein contain a set of tables summarizing toxicity data where temperature was specified (Appendix A). These tables are keyed to a listing of the literature (Appendix B) which is in the coded numerical order. Alphabetical and other listings are available but this particular listing allows expansion of the cited literature without a complex renumbering system. To increase the utility of this reference list, a comprehensive index is included (Appendix C). All references dealing with a particular subject can be determined by a subject search in Appendix C The next appendix contains a listing of all references by toxicant type (Appendix D), which are included in the tables. The toxicants are listed alphabetically each with its own alphabetical listing of test organisms The final index (Appendix E) is a list of authors keyed to the reference numbered

Sources of literature

There is a significant amount of literature on temperature and toxicity effects in aquatic ecosystems: thus several arbitrary decisions about how to survey this literature were made: 1) only recent literature was surveyed because previous literature surveys have been quite comprehensive, 2) most of the literature was gleaned from abstracting services as described below, and 3) the literature survey was primarily restricted to considerations of temperature and toxicity as they apply to algae, fish, and other aquatic biota.

The abstracting services utilized were Dissertation Abstracts (1965 to date), Journal Water Pollution Control Federation, Annual Literature Survey (1965 to date), Chemical Abstracts (1962 to date) and Biological Abstracts (1965 to date). In addition a few searches of the literature based on lists of references cited by an author for pertinent publications were made

For the abstracting services only certain categories were searched: these are as follows:

A. Dissertation Abstracts. Within each of the following overall categories, these subcategories were searched: temperature, toxicity, thermal, fish, algae.

> Biochemistry, Biology, Civil Engineering, Chemical Engineering, Sanitary Engineering, Entomology, Marine Sciences, Zoology.

B Journal, Water Pollution Control Federation

> Water Pollution: effects on fresh water microfauna, freshwater macrovertebrates, marine life, biological effects of thermal pollution, effects on freshwater fish.

C. Chemical Abstracts and D. Biological Abstracts

> Algae, Fish, H_2S, Phenol, Toxicity, Temperature, Thermal.

Although this report is not completely comprehensive, it should serve as an excellent beginning for anyone interested in this area of research.

CONCLUSIONS

As shown in the literature summarized in the Tables (Appendix A), in the reference section (Appendix B), and noted in the comprehensive index, there is very little uniformity in experimental design, and attempts to generalize based on the literature are difficult. It is hoped that this compilation will allow investigators to consider the relationships described herein as a guide for experimental design as well as a direction for further research and evaluation. In all cases standard bioassay procedures should be utilized, and these procedures should be applied to experimental designs which allow the estimation of parameters related to theoretical effects of temperature.

APPENDIX A

SUMMARY OF TEMPERATURE-TOXICITY DATA COLLECTED

IN LITERATURE REVIEW

Stimulus	Organism	Experimental Habitat	Response	Stimulus Conc. mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
ABATE	Stonefly P. californica	lab	death	0.120	15.5	LC_{50}	24 hr.	687	24 hr. DDT LC_{50}, µg/lit.
ABATE	Stonefly P. californica	lab	death	0.100	15.5	LC_{50}	48 hr.	687	
ABATE	Stonefly P. californica	lab	death	0.010	15.5	LC_{50}	96 hr.	687	
ABS	Bluegill Lepomis macrochirus	lab	death	24.8	25 ± 1	TL_m	24 hr.	913	
ABS	Bluegill Lepomis macrochirus	lab	death	16.5	25 ± 1	TL_m	24 hr.	913	
ABS	Bluegill Lepomis macrochirus	lab	death	17.8	25 ± 1	TL_m	24 hr.	913	
ABS	Bluegill Lepomis macrochirus	lab	death	21.2	25 ± 1	TL_m	96 hr.	913	
ABS	Bluegill Lepomis macrochirus	lab	death	15.8	25 ± 1	TL_m	96 hr.	913	
ABS	Bluegill Lepomis macrochirus	lab	death	17.3	25 ± 1	TL_m	96 hr.	913	
ABS	Bluegill Lepomis macrochirus	lab	death	21.2	25 ± 1	TL_m	10 days	913	
ABS	Bluegill Lepomis macrochirus	lab	death	15.5	25 ± 1	TL_m	10 days	913	
ABS	Bluegill Lepomis macrochirus	lab	death	17.3	25 ± 1	TL_m	10 days	913	
ABS	Bluegill Lepomis macrochirus	lab	death	19.6	25 ± 1	TL_m	20 days	913	
ABS	Bluegill Lepomis macrochirus	lab	death	15.5	25 ± 1	TL_m	20 days	913	
ABS	Bluegill Lepomis macrochirus	lab	death	17.3	25 ± 1	TL_m	20 days	913	
ABS	Bluegill Lepomis macrochirus	lab	death	18.3	25 ± 1	TL_m	30 days	913	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Rate	Temp. Range Studied °C	Rate Function	Time to Effect	Ref. No.	Remarks
ABS	Bluegill *Lepomis macrochirus*	lab	death	15.5	25 ± 1	TL_m	30 days	913	
ABS	Bluegill *Lepomis macrochirus*	lab	death	17.3	25 ± 1	TL_m	30 days	913	
ABS	Bluegill *Lepomis macrochirus*	lab	death	25.4	25 ± 1	TL_m	48 hr.	913	acclimation concentration (ppm) 13.0
ABS	Bluegill *Lepomis macrochirus*	lab	death	25.4	25 ± 1	TL_m	48 hr.	913	6.5
ABS	Bluegill *Lepomis macrochirus*	lab	death	18.3	25 ± 1	TL_m	48 hr.	913	3.25
ABS	Bluegill *Lepomis macrochirus*	lab	death	18.3	25 ± 1	TL_m	48 hr.	913	1.9
ABS	Bluegill *Lepomis macrochirus*	lab	death	18.3	25 ± 1	TL_m	48 hr.	913	1.3
ABS	Bluegill *Lepomis macrochirus*	lab	death	16.0	25 ± 1	TL_m	48 hr.	913	0.0 (control)
ABS	Fathead minnow *Pimephales promelas*	lab	death	13.8	21 ± 1	TL_m	1 day	1192	rate function is a graphical interpolation
ABS	Fathead minnow *Pimephales promelas*	lab	death	13.0	21	TL_m	2 days	1192	
ABS	Fathead minnow *Pimephales promelas*	lab	death	11.7	21 ± 1	TL_m	3 days	1192	
ABS	Fathead minnow *Pimephales promelas*	lab	death	11.5	21 ± 1	TL_m	4 days	1192	
ABS	Fathead minnow *Pimephales promelas*	lab	death	11.0	21 ± 1	TL_m	5 days	1192	
ABS	Fathead minnow *Pimephales promelas*	lab	death	9.2	21 ± 1	TL_m	6 days	1192	
ABS	Fathead minnow *Pimephales promelas*	lab	death	8.6	21 ± 1	TL_m	7 days	1192	
ABS	Fathead minnow *Pimephales promelas*	lab	death	7.0	21 ± 1	TL_m	8 days	1192	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [illegible]	Temp. Range Studied °C	Rate Func	Rate Effect	Ref. No.	Remarks
ABS	Fathead minnow Pimephales promelas	lab	death	6.4	21 ± 1	TL_m	9 days	1192	
Acetone	Harlequin fish Rasbora heteromorpha	lab	death	5,700	18 - 20	TL_m	24 hr.	546	
Acetone	Harlequin fish Rasbora heteromorpha	lab	death	4,000	18 - 20	TL_m	48 hr.	546	
Aldrin	Stonefly P. californica	lab	death	30	15.5	LC_{50}	24 hr.	687	
Aldrin	Stonefly P. californica	lab	death	8.0	15.5	LC_{50}	48 hr.	687	
Aldrin	Stonefly P. californica	lab	death	1.3	15.5	LC_{50}	96 hr.	687	
Allethrin	Stonefly P. californica	lab	death	9.0	15.5	LC_{50}	24 hr.	687	
Allethrin	Stonefly P. californica	lab	death	5.6	15.5	LC_{50}	48 hr.	687	
Allethrin	Stonefly P. californica	lab	death	2.1	15.5	LC_{50}	96 hr.	687	
Alpha-amino 2,6-dichlorobenzaldoxine	Harlequin fish Rasbora heteromorpha	lab	death	520	18 - 20	TL_m	24 hr.	546	
Alpha-amino 2,6-dichlorobenzaldoxine	Harlequin fish Rasbora heteromorpha	lab	death	440	18 - 20	TL_m	48 hr.	546	
Alpha-amino 2,6-dichlorobenzaldoxine hydrochloride	Harlequin fish Rasbora heteromorpha	lab	death	240	18 - 20	TL_m	24 hr.	546	
Alpha-amino 2,6-dichlorobenzaldoxine hydrochloride	Harlequin fish Rasbora heteromorpha	lab	death	200	18 - 20	TL_m	48 hr.	546	
Alpha-chlorhydrin	Harlequin fish Rasbora heteromorpha	lab	death	2,150	18 - 20	TL_m	24 hr.	546	
Alpha-chlorhydrin	Harlequin fish Rasbora heteromorpha	lab	death	2,100	18 - 20	TL_m	48 hr.	546	
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	1,250	18 - 20	TL_m	24 hr.	546	

Stimulus	Organism	Experimental Habitat	Response	Stimulus	Temp. Range [illegible]	Rate Function	Rate Effect	[illegible]o.	Remarks
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	1,100	18 - 20	TL_m	48 hr.	546	
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	700	18 - 20	TL_m	24 hr.	546	
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	--	18 - 20	TL_m	48 hr.	546	
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	3,200 g	18 - 20	TL_m	24 hr.	546	
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	--	18 - 20	TL_m	48 hr.	546	
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	510 g	18 - 20	TL_m	24 hr.	546	
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	--	18 - 20	TL_m	48 hr.	546	
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	55 g	18 - 20	TL_m	24 hr.	546	
Ammonium sulphamate	Harlequin fish Rasbora heteromorpha	lab	death	--	18 - 20	TL_m	48 hr.	546	
Antimycin A without dye	Bluegill Lepomis macrochirus	lab	death	0.000144	12	LC_{50}	96 hr.	288	95% confidence
Antimycin A without dye	Channel catfish Ictalurus punctatus	lab	death	0.0147	12	LC_{50}	96 hr.	288	95% confidence
Antimycin A without dye	Rainbow trout Salmo gairdnerii	lab	death	0.000048	12	LC_{50}	96 hr.	288	95% confidence
Antimycin A with Rhodamine B	Bluegill Lepomis macrochirus	lab	death	0.000156	12	LC_{50}	96 hr.	288	95% confidence rhodamine B = 5 ppm
Antimycin A with Rhodamine B	Channel catfish Ictalurus punctatus	lab	death	0.0108	12	LC_{50}	96 hr.	288	95% confidence rhodamine B = 5 ppm
Antimycin A with Rhodamine B	Rainbow trout Salmo gairdnerii	lab	death	0.000047	12	LC_{50}	96 hr.	288	95% confidence rhodamine B 5 ppm
Antimycin A with Rhodamine B	Bluegill Lepomis macrochirus	lab	death	0.000026	12	LC_{50}	96 hr.	288	95% confidence rhodamine B = 100 ppm

Stimulus	Organism	Experimental Habit	Response	Stimulus [illegible]	Temp Range Studied °C	Rate Function	[illegible]	Ref.	Remarks
Antimycin A with Rhodamine B	Channel catfish *Ictalurus punctatus*	lab	death	--	12	LC_{50}	96 hr.	288	95% confidence rhodamine B = 100 ppm
Antimycin A with Rhodamine B	Rainbow trout *Salmo gairdnerii*	lab	death	--	12	LC_{50}	96 hr.	288	95% confidence rhodamine B = 100 ppm
Antimycin A with Fluorescein	Bluegill *Lepomis macrochirus*	lab	death	0.000233	12	LC_{50}	96 hr.	288	95% confidence fluorescein = 5 ppm
Antimycin A with Fluorescein	Channel catfish *Ictalurus punctatus*	lab	death	0.0133	12	LC_{50}	96 hr.	288	95% confidence fluorescein = 5 ppm
Antimycin A with Fluorescein	Rainbow trout *Salmo gairdnerii*	lab	death	0.000056	12	LC_{50}	96 hr.	288	95% confidence fluorescein = 5 ppm
Antimycin A with Fluorescein	Bluegill *Lepomis macrochirus*	lab	death	0.000044	12	LC_{50}	96 hr.	288	95% confidence fluorescein = 100 ppm
Antimycin A with Fluorescein	Channel catfish *Ictalurus punctatus*	lab	death	--	12	LC_{50}	96 hr.	288	95% confidence fluorescein = 100 ppm
Antimycin A with Fluorescein	Rainbow trout *Salmo gairdnerii*	lab	death	--	12	LC_{50}	96 hr.	288	95% confidence fluorescein = 100 ppm
Ardrox	Harlequin fish *Rasbora heteromorpha*	lab	death	5.6	18-20	TL_m	24 hr.	546	
Ardrox	Harlequin fish *Rasbora heteromorpha*	lab	death	5.0	18-20	TL_m	48 hr.	546	
Arkotine DDT	Harlequin fish *Rasbora heteromorpha*	lab	death	0.2	18-20	TL_m	24 hr.	546	
Arkotine DDT	Harlequin fish *Rasbora heteromorpha*	lab	death	0.17	18-20	TL_m	48 hr.	546	
Arsenic	Goldfish *Carassius auratus*	lab	death	32.0	19-25	LC_{50}	7 days	1017	
Arsenic	Goldfish *Carassius auratus*	lab	death	1.5	19-25	LC_1	7 days	1017	
Asulum (potassium salt)	Harlequin fish *Rasbora heteromorpha*	lab	death	5,200	18-20	TL_m	24 hr.	546	
Asulum (potassium salt)	Harlequin fish *Rasbora heteromorpha*	lab	death	--	18-20	TL_m	48 hr.	546	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Asulum (potassium salt)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	1,700	18-20	TL_m	24 hr.	546	
Asulum (potassium salt)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	1,200	18-20	TL_m	48 hr.	546	
Atlavar	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	1,550	18-20	TL_m	24 hr.	546	
Atlavar	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	1,300	18-20	TL_m	48 hr.	546	
Basol 99 (cleaning fluid)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	46	18-20	TL_m	24 hr.	546	
Basol 99 (cleaning fluid)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	42	18-20	TL_m	48 hr.	546	
Basol 99 (cleaning fluid)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	38	18-20	TL_m	24 hr.	546	
Basol 99 (cleaning fluid)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	32	18-20	TL_m	48 hr.	546	
Bayer 73	Stonefly <u>P. californica</u>	lab	death	2.30	15.5	LC_{50}	24 hr.	687	
Bayer 73	Stonefly <u>P. californica</u>	lab	death	0.90	15.5	LC_{50}	48 hr.	687	
Bayer 73	Stonefly <u>P. californica</u>	lab	death	0.20	15.5	LC_{50}	96 hr.	687	
Bayer 37289	Stonefly <u>P. californica</u>	lab	death	0.014	15.5	LC_{50}	24 hr.	687	
Bayer 37289	Stonefly <u>P. californica</u>	lab	death	0.0055	15.5	LC_{50}	48 hr.	687	
Bayer 37289	Stonefly <u>P. californica</u>	lab	death	0.001	15.5	LC_{50}	96 hr.	687	
Bayer 37344	Stonefly <u>P. californica</u>	lab	death	0.020	15.5	LC_{50}	24 hr.	687	
Bayer 37344	Stonefly <u>P. californica</u>	lab	death	0.016	15.5	LC_{50}	48 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus mg/l	Temp. Range Studied C	Rate Function	Rate Effect	Ref.	Remarks
Bayer 37344	Stonefly <u>P. californica</u>	lab	death	0.0054	15.5	LC_{50}	96 hr.	687	
Bayer 41831	Stonefly <u>P. californica</u>	lab	death	0.032	15.5	LC_{50}	24 hr.	687	
Bayer 41831	Stonefly <u>P. californica</u>	lab	death	0.017	15.5	LC_{50}	48 hr.	687	
Bayer 41831	Stonefly <u>P. californica</u>	lab	death	0.004	15.5	LC_{50}	96 hr.	687	
Baygon	Stonefly <u>P. californica</u>	lab	death	0.025	15.5	LC_{50}	24 hr.	687	
Baygon	Stonefly <u>P. californica</u>	lab	death	0.022	15.5	LC_{50}	48 hr.	687	
Baygon	Stonefly <u>P. californica</u>	lab	death	0.013	15.5	LC_{50}	96 hr.	687	
Baywood 43	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	1,000	18-20	TL_m	24 hr.	546	
Baywood 43	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	880	18-20	TL_m	48 hr.	546	
Benazolin	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	360	18-20	TL_m	24 hr.	546	
Benazolin	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	325	18-20	TL_m	48 hr.	546	
Bidrin	Red crawfish <u>Procamburus clarki</u>	lab	death	5.5	16-32	TL_m	24 hr.	904	
Bidrin	Red crawfish <u>Procamburus clarki</u>	lab	death	4.0	16-32	TL_m	48 hr.	904	
Bidrin	Red crawfish <u>Procamburus clarki</u>	lab	death	3.0	16-32	TL_m	72 hr.	904	
Bidrin	Stonefly <u>P. californica</u>	lab	death	2.5	15.5	LC_{50}	24 hr.	687	
Bidrin	Stonefly <u>P. californica</u>	lab	death	1.9	15.5	LC_{50}	48 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus	Temp. Range Studied	Rate Function	Rate Effect	Ref.	Remarks
Bidrin	Stonefly P. californica	lab	death	0.430	15.5	LC_{50}	96 hr.	687	
Brakontrole	Harlequin fish Rasbora heteromorpha	lab	death	180	18-20	TL_m	24 hr.	546	
Brakontrole	Harlequin fish Rasbora heteromorpha	lab	death	125	18-20	TL_m	48 hr.	546	
Busan 90	Harlequin fish Rasbora heteromorpha	lab	death	1.8	18-20	TL_m	24 hr.	546	
Busan 90	Harlequin fish Rasbora heteromorpha	lab	death	1.5	18-20	TL_m	48 hr.	546	
Busan 181	Harlequin fish Rasbora heteromorpha	lab	death	1.1	18-20	TL_m	24 hr.	546	
Busan 181	Harlequin fish Rasbora heteromorpha	lab	death	0.65	18-20	TL_m	48 hr.	546	
Cadmium chloride	Bluegill Lepomis macrochirus	lab	death	4.56	25	TL_m	24 hr.	1130	soft water
Cadmium chloride	Bluegill Lepomis macrochirus	lab	death	2.76	25	TL_m	48 hr.	1130	soft water
Cadmium chloride	Fathead minnow Pimephales promelas	lab	death	1.09	25	TL_m	24 hr	1130	soft water
Cadmium chloride	Fathead minnow Pimephales promelas	lab	death	1.09	25	TL_m	48 hr.	1130	soft water
Cadmium chloride	Fathead minnow Pimephales promelas	lab	death	67	25	TL_m	24 hr.	1130	soft water
Cadmium chloride	Fathead minnow Pimephales promelas	lab	death	.67	25	TL_m	48 hr.	1130	soft water
Cadmium chloride	Fathead minnow Pimephales promelas	lab	death	78.1	25	TL_m	24 hr.	1130	hard water
Cadmium chloride	Fathead minnow Pimephales promelas	lab	death	72.6	25	TL_m	48 hr.	1130	hard water
Cadmium chloride	Fathead minnow Pimephales promelas	lab	death	79.3	25	TL_m	24 hr.	1130	hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Cadmium chloride	Fathead minnow Pimephales promelas	lab	death	79.3	25	TL_m	48 hr.	1130	hard water
Cadmium chloride	Goldfish Carassius auratus	lab	death	3.46	25	TL_m	24 hr.	1130	soft water
Cadmium chloride	Goldfish Carassius auratus	lab	death	2.62	25	TL_m	48 hr.	1130	soft water
Cadmium chloride	Green sunfish Lepomis cyanellus	lab	death	7.84	25	TL_m	24 hr.	1130	soft water
Cadmium chloride	Green sunfish Lepomis cyanellus	lab	death	3.68	25	TL_m	48 hr.	1130	soft water
Cadmium chloride	Green sunfish Lepomis cyanellus	lab	death	88.6	25	TL_m	24 hr.	1130	hard water
Cadmium chloride	Green sunfish Lepomis cyanellus	lab	death	71.3	25	TL_m	48 hr.	1130	hard water
Cadmium chloride	Guppy Lebistes reticulatus	lab	death	3.37	25	TL_m	24 hr.	1130	soft water
Cadmium chloride	Guppy Lebistes reticulatus	lab	death	2.31	25	TL_m	48 hr.	1130	soft water
Canal bank weedkiller	Harlequin fish Rasbora heteromorpha	lab	death	1,080	18-20	TL_m	24 hr.	546	
Canal bank weedkiller	Harlequin fish Rasbora heteromorpha	lab	death	610	18-20	TL_m	48 hr.	546	
Carbaryl	Stonefly P. badia	lab	death	0.005	15.5	LC_{50}	24 hr.	687	
Carbaryl	Stonefly P. badia	lab	death	0.0036	15.5	LC_{50}	48 hr.	687	
Carbaryl	Stonefly P. badia	lab	death	0.0017	15.5	LC_{50}	96 hr	687	
Casaron G	Harlequin fish Rasbora heteromorpha	lab	death	120	18-20	TL_m	24 hr.	546	
Casaron G	Harlequin fish Rasbora heteromorpha	lab	death	100	18-20	TL_m	48 hr.	546	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref.	Remarks
Casaron 133	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	29	18-20	TL_m	24 hr.	546	
Casaron 133	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	25	18-20	TL_m	48 hr.	546	
Chlorea	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	1,150	18-20	TL_m	24 hr.	546	
Chlorea	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	1,100	18-20	TL_m	48 hr.	546	
Chlorax	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	2,000	18-20	TL_m	24 hr.	546	
Chlorax	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	1,800	18-20	TL_m	48 hr.	546	
Chlorobenzene	Bluegill <u>Lepomis macrochirus</u>	lab	death	24.00	25	TL_m	24 hr.	1252	soft water
Chlorobenzene	Bluegill <u>Lepomis macrochirus</u>	lab	death	24.00	25	TL_m	48 hr.	1252	soft water
Chlorobenzene	Bluegill <u>Lepomis macrochirus</u>	lab	death	24.00	25	TL_m	96 hr.	1252	soft water
Chlorobenzene	Fathead minnow <u>Pimephales promelas</u>	lab	death	29.12	25	TL_m	24 hr.	1252	soft water
Chlorobenzene	Fathead minnow <u>Pimephales promelas</u>	lab	death	29.12	25	TL_m	48 hr.	1252	soft water
Chlorobenzene	Fathead minnow <u>Pimephales promelas</u>	lab	death	29.12	25	TL_m	96 hr.	1252	soft water
Chlorobenzene	Fathead minnow <u>Pimephales promelas</u>	lab	death	33.93	25	TL_m	24 hr.	1252	soft water
Chlorobenzene	Fathead minnow <u>Pimephales promelas</u>	lab	death	33.93	25	TL_m	48 hr.	1252	soft water
Chlorobenzene	Fathead minnow <u>Pimephales promelas</u>	lab	death	33.93	25	TL_m	96 hr.	1252	soft water
Chlorobenzene	Fathead minnow <u>Pimephales promelas</u>	lab	death	39.19	25	TL_m	24 hr.	1252	hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus Conc. mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref.	Remarks
Chlorobenzene	Fathead minnow Pimephales promelas	lab	death	34.98	25	TL_m	48 hr.	1252	hard water
Chlorobenzene	Fathead minnow Pimephales promelas	lab	death	33.93	25	TL_m	96 hr.	1252	hard water
Chlorobenzene	Goldfish Carassius auratus	lab	death	73.03	25	TL_m	24 hr.	1252	
Chlorobenzene	Goldfish Carassius auratus	lab	death	56.00	25	TL_m	48 hr.	1252	
Chlorobenzene	Goldfish Carassius auratus	lab	death	51.62	25	TL_m	96 hr.	1252	
Chlorobenzene	Guppies Lebistes reticulatus	lab	death	45.53	25	TL_m	24 hr.	1252	
Chlorobenzene	Guppies Lebistes reticulatus	lab	death	45.53	25	TL_m	48 hr.	1252	
Chlorobenzene	Guppies Lebistes reticulatus	lab	death	45.53	25	TL_m	96 hr.	1252	
0-Chlorophenol	Bluegill Lepomis macrochirus	lab	death	8.2	20	TL_m	24 hr.	1163	
0-Chlorophenol	Bluegill Lepomis macrochirus	lab	death	8.1	20	TL_m	48 hr.	1163	
0-Chlorophenol	Bluegill Lepomis macrochirus	lab	death	11.31	25	TL_m	24 hr.	1252	soft water
0-Chlorophenol	Bluegill Lepomis macrochirus	lab	death	10.59	25	TL_m	48 hr.	1252	soft water
0-Chlorophenol	Bluegill Lepomis macrochirus	lab	death	10.00	25	TL_m	96 hr.	1252	soft water
0-Chlorophenol	Fathead minnow Pimephales promelas	lab	death	21.96	25	TL_m	24 hr.	1252	soft water
0-Chlorophenol	Fathead minnow Pimephales promelas	lab	death	19.12	25	TL_m	48 hr.	1252	soft water
0-Chlorophenol	Fathead minnow Pimephales promelas	lab	death	11.63	25	TL_m	96 hr.	1252	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
0-Chlorophenol	Fathead minnow *Pimephales promelas*	lab	death	21.52	25	TL_m	24 hr.	1252	hard water
0-Chlorophenol	Fathead minnow *Pimephales promelas*	lab	death	18.00	25	TL_m	48 hr.	1252	hard water
0-Chlorophenol	Fathead minnow *Pimephales promelas*	lab	death	14.48	25	TL_m	96 hr.	1252	hard water
0-Chlorophenol	Goldfish *Carassius auratus*	lab	death	14.48	25	TL_m	24 hr.	1252	soft water
0-Chlorophenol	Goldfish *Carassius auratus*	lab	death	12.37	25	TL_m	48 hr.	1252	soft water
0-Chlorophenol	Goldfish *Carassius auratus*	lab	death	12.37	25	TL_m	96 hr.	1252	soft water
0-Chlorophenol	Guppies *Lebistes reticulatus*	lab	death	22.17	25	TL_m	24 hr.	1252	soft water
0-Chlorophenol	Guppies *Lebistes reticulatus*	lab	death	20.78	25	TL_m	48 hr.	1252	soft water
0-Chlorophenol	Guppies *Lebistes reticulatus*	lab	death	20.17	25	TL_m	96 hr.	1252	soft water
3-Chloropropene	Bluegill *Lepomis macrochirus*	lab	death	59.30	25	TL_m	24 hr.	1252	soft water
3-Chloropropene	Bluegill *Lepomis macrochirus*	lab	death	42.33	25	TL_m	48 hr.	1252	soft water
3-Chloropropene	Bluegill *Lepomis macrochirus*	lab	death	42.33	25	TL_m	96 hr.	1252	soft water
3-Chloropropene	Fathead minnow *Pimephales promelas*	lab	death	24.00	25	TL_m	24 hr.	1252	soft water
3-Chloropropene	Fathead minnow *Pimephales promelas*	lab	death	24.00	25	TL_m	48 hr.	1252	soft water
3-Chloropropene	Fathead minnow *Pimephales promelas*	lab	death	19.78	25	TL_m	96 hr.	1252	soft water
3-Chloropropene	Fathead minnow *Pimephales promelas*	lab	death	25.86	25	TL_m	24 hr.	1252	hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No	Remarks
3-Chloropropene	Fathead minnow <u>Pimephales promelas</u>	lab	death	24.00	25	TL_m	48 hr.	1252	hard water
3-Chloropropene	Fathead minnow <u>Pimephales promelas</u>	lab	death	24.00	25	TL_m	96 hr.	1252	hard water
3-Chloropropene	Goldfish <u>Carassius auratus</u>	lab	death	26.56	25	TL_m	24 hr.	1252	soft water
3-Chloropropene	Goldfish <u>Carassius auratus</u>	lab	death	20.87	25	TL_m	48 hr.	1252	soft water
3-Chloropropene	Goldfish <u>Carassius auratus</u>	lab	death	20.87	25	TL_m	96 hr.	1252	soft water
3-Chloropropene	Guppies <u>Lebistes reticulatus</u>	lab	death	57.68	25	TL_m	24 hr.	1252	soft water
3-Chloropropene	Guppies <u>Lebistes reticulatus</u>	lab	death	53.54	25	TL_m	48 hr.	1252	soft water
3-Chloropropene	Guppies <u>Lebistes reticulatus</u>	lab	death	51.08	25	TL_m	96 hr.	1252	soft water
Chlorothion	Fathead minnow <u>Pimephales promelas</u>	lab	death	5.0	25	TL_m	24 hr.	1187	soft water
Chlorothion	Fathead minnow <u>Pimephales promelas</u>	lab	death	3.4	25	TL_m	48 hr.	1187	soft water
Chlorothion	Fathead minnow <u>Pimephales promelas</u>	lab	death	3.3	25	TL_m	96 hr.	1187	soft water
Chlorothion	Fathead minnow <u>Pimephales promelas</u>	lab	death	3.9	25	TL_m	24 hr.	1187	hard water
Chlorothion	Fathead minnow <u>Pimephales promelas</u>	lab	death	3.4	25	TL_m	48 hr.	1187	hard water
Chlorothion	Fathead minnow <u>Pimephales promelas</u>	lab	death	3.3	25	TL_m	96 hr.	1187	hard water
Chlorthiamid	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	41	18-20	TL_m	24 hr.	546	
Chlorthiamid	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	33	18-20	TL_m	48 hr.	546	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Chromium potassium sulphate	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	67.4	25	TL_m	24 hr.	1130	soft water
Chromium potassium sulphate	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	38.7	25	TL_m	48 hr.	1130	soft water
Chromium potassium sulphate	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	7.46	25	TL_m	96 hr.	1130	soft water
Chromium potassium sulphate	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	84.0	25	TL_m	24 hr.	1130	hard water
Chromium potassium sulphate	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	71.9	25	TL_m	48 hr.	1130	hard water
Chromium potassium sulphate	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	71.9	25	TL_m	96 hr.	1130	hard water
Chromium potassium sulphate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	5.37	25	TL_m	24 hr.	1130	soft water
Chromium potassium sulphate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	5.22	25	TL_m	48 hr.	1130	soft water
Chromium potassium sulphate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	5.07	25	TL_m	96 hr.	1130	soft water
Chromium potassium sulphate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	77.5	25	TL_m	24 hr.	1130	hard water
Chromium potassium sulphate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	67.4	25	TL_m	48 hr.	1130	hard water
Chromium potassium sulphate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	67.4	25	TL_m	96 hr.	1130	hard water
Chromium potassium sulphate	Goldfish <u>Carassius</u> <u>auratus</u>	lab	death	11.0	25	TL_m	24 hr.	1130	soft water
Chromium potassium sulphate	Goldfish <u>Carassius</u> <u>auratus</u>	lab	death	5.37	25	TL_m	48 hr.	1130	soft water
Chromium potassium sulphate	Goldfish <u>Carassius</u> <u>auratus</u>	lab	death	4.10	25	TL_m	96 hr.	1130	soft water
Chromium potassium sulphate	Guppies <u>Lebistes</u> <u>reticulatus</u>	lab	death	4.10	25	TL_m	24 hr.	1130	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Chromium potassium sulphate	Guppies <u>Lebistes reticulatus</u>	lab	death	3.85	25	TL_m	48 hr.	1130	soft water
Chromium potassium sulphate	Guppies <u>Lebistes reticulatus</u>	lab	death	3.33	25	TL_m	96 hr.	1130	soft water
Chlordane	Stonefly <u>P. californica</u>	lab	death	0.170	15.5	LC_{50}	24 hr.	687	
Chlordane	Stonefly <u>P. californica</u>	lab	death	0.055	15.5	LC_{50}	48 hr.	687	
Chlordane	Stonefly <u>P. californica</u>	lab	death	0.015	15.5	LC_{50}	96 hr.	687	
Concentrated borasceu	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	2,800	18-20	TL_m	24 hr.	546	
Concentrated borasceu	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	1,800	18-20	TL_m	48 hr.	546	
Copper sulphate	Bluegill <u>Lepomis macrochirus</u>	lab	death	.86	25	TL_m	24 hr.	1130	soft water
Copper sulphate	Bluegill <u>Lepomis macrochirus</u>	lab	death	.74	25	TL_m	48 hr.	1130	soft water
Copper sulphate	Bluegill <u>Lepomis macrochirus</u>	lab	death	.66	25	TL_m	96 hr.	1130	soft water
Copper sulphate	Bluegill <u>Lepomis macrochirus</u>	lab	death	10.7	25	TL_m	24 hr.	1130	hard water
Copper sulphate	Bluegill <u>Lepomis macrochirus</u>	lab	death	10.2	25	TL_m	48 hr.	1130	hard water
Copper sulphate	Bluegill <u>Lepomis macrochirus</u>	lab	death	10.2	25	TL_m	96 hr.	1130	hard water
Copper sulphate	Fathead minnow <u>Pimephales promelas</u>	lab	death	040	25	TL_m	24 hr.	1130	soft water
Copper sulphate	Fathead minnow <u>Pimephales promelas</u>	lab	death	.035	25	TL_m	48 hr.	1130	soft water
Copper sulphate	Fathead minnow <u>Pimephales promelas</u>	lab	death	.025	25	TL_m	96 hr.	1130	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [c] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	.041	25	TL_m	24 hr.	1130	soft water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	.023	25	TL_m	48 hr.	1130	soft water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	.023	25	TL_m	96 hr.	1130	soft water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	.034	25	TL_m	24 hr.	1130	soft water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	.029	25	TL_m	48 hr.	1130	soft water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	.023	25	TL_m	96 hr.	1130	soft water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	.036	25	TL_m	24 hr.	1130	soft water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	.023	25	TL_m	48 hr.	1130	soft water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	.022	25	TL_m	96 hr.	1130	soft water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	2.71	25	TL_m	24 hr.	1130	hard water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	1.86	25	TL_m	48 hr.	1130	hard water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	1.76	25	TL_m	96 hr.	1130	hard water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	1.59	25	TL_m	24 hr.	1130	hard water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	1.14	25	TL_m	48 hr.	1130	hard water
Copper sulphate	Fathead minnow *Pimephales promelas*	lab	death	1.14	25	TL_m	96 hr.	1130	hard water
Copper sulphate	Goldfish *Carassius auratus*	lab	death	.094	25	TL_m	24 hr.	1130	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Copper sulphate	Goldfish *Carassius auratus*	lab	death	.043	25	TL_m	48 hr.	1130	soft water
Copper sulphate	Goldfish *Carassius auratus*	lab	death	.036	25	TL_m	96 hr.	1130	soft water
Copper sulphate	Guppies *Lebistes reticulatus*	lab	death	.13	25	TL_m	24 hr.	1130	soft water
Copper sulphate	Guppies *Lebistes reticulatus*	lab	death	.073	25	TL_m	48 hr.	1130	soft water
Copper sulphate	Guppies *Lebistes reticulatus*	lab	death	.036	25	TL_m	96 hr.	1130	soft water
0-Cresol	Bluegill *Lepomis macrochirus*	lab	death	22.17	25	TL_m	24 hr.	1252	soft water
0-Cresol	Bluegill *Lepomis macrochirus*	lab	death	20.78	25	TL_m	48 hr.	1252	soft water
0-Cresol	Bluegill *Lepomis macrochirus*	lab	death	20.78	25	TL_m	96 hr.	1252	soft water
0-Cresol	Fathead minnow *Pimephales promelas*	lab	death	not found	25	TL_m	24 hr.	1252	soft water
0-Cresol	Fathead minnow *Pimephales promelas*	lab	death	not found	25	TL_m	48 hr.	1252	soft water
0-Cresol	Fathead minnow *Pimephales promelas*	lab	death	12.55	25	TL_m	96 hr.	1252	soft water
0-Cresol	Fathead minnow *Pimephales promelas*	lab	death	18.00	25	TL_m	24 hr.	1252	hard water
0-Cresol	Fathead minnow *Pimephales promelas*	lab	death	13.42	25	TL_m	48 hr.	1252	hard water
0-Cresol	Fathead minnow *Pimephales promelas*	lab	death	13.42	25	TL_m	96 hr.	1252	hard water
0-Cresol	Goldfish *Carassius auratus*	lab	death	not found	25	TL_m	24 hr.	1252	soft water
0-Cresol	Goldfish *Carassius auratus*	lab	death	not found	25	TL_m	48 hr.	1252	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
0-Cresol	Goldfish *Carassius auratus*	lab	death	23.25	25	TL_m	96 hr.	1252	soft water
0-Cresol	Guppies *Lebistes reticulatus*	lab	death	49.13	25	TL_m	24 hr.	1252	soft water
0-Cresol	Guppies *Lebistes reticulatus*	lab	death	25.31	25	TL_m	48 hr.	1252	soft water
0-Cresol	Guppies *Lebistes reticulatus*	lab	death	18.85	25	TL_m	96 hr.	1252	soft water
Crotothane	Harlequin fish *Rasbora heteromorpha*	lab	death	0.39	18-20	TL_m	24 hr.	546	
Crotothane	Harlequin fish *Rasbora heteromorpha*	lab	death	0.27	18-20	TL_m	48 hr.	546	
Cunilate RQ 24	Harlequin fish *Rasbora heteromorpha*	lab	death	1.5	18-20	TL_m	24 hr.	546	
Cunilate RQ 24	Harlequin fish *Rasbora heteromorpha*	lab	death	0.9	18-20	TL_m	48 hr.	546	
Cyclohexane	Bluegill *Lepomis macrochirus*	lab	death	42.33	25	TL_m	24 hr.	1252	
Cyclohexane	Bluegill *Lepomis macrochirus*	lab	death	40.60	25	TL_m	48 hr.	1252	
Cyclohexane	Bluegill *Lepomis macrochirus*	lab	death	34.72	25	TL_m	96 hr.	1252	
Cyclohexane	Fathead minnow *Pimephales promelas*	lab	death	35.08	25	TL_m	24 hr.	1252	soft water
Cyclohexane	Fathead minnow *Pimephales promelas*	lab	death	35.08	25	TL_m	48 hr.	1252	soft water
Cyclohexane	Fathead minnow *Pimephales promelas*	lab	death	32.71	25	TL_m	96 hr.	1252	soft water
Cyclohexane	Fathead minnow *Pimephales promelas*	lab	death	42.33	25	TL_m	24 hr.	1252	hard water
Cyclohexane	Fathead minnow *Pimephales promelas*	lab	death	42.33	25	TL_m	48 hr.	1252	hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] (mg/l)	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Cyclohexane	Fathead minnow <u>Pimephales promelas</u>	lab	death	42.33	25	TL_m	96 hr.	1252	hard water
Cyclohexane	Goldfish <u>Carassius auratus</u>	lab	death	42.33	25	TL_m	24 hr.	1252	soft water
Cyclohexane	Goldfish <u>Carassius auratus</u>	lab	death	42.33	25	TL_m	48 hr.	1252	soft water
Cyclohexane	Goldfish <u>Carassius auratus</u>	lab	death	42.33	25	TL_m	96 hr.	1252	soft water
Cyclohexane	Guppies <u>Lebistes reticulatus</u>	lab	death	57.68	25	TL_m	24 hr.	1252	soft water
Cyclohexane	Guppies <u>Lebistes reticulatus</u>	lab	death	57.68	25	TL_m	48 hr.	1252	soft water
Cyclohexane	Guppies <u>Lebistes reticulatus</u>	lab	death	57.68	25	TL_m	96 hr.	1252	soft water
Dalacide	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	900	18-20	TL_m	24 hr.	546	soft water
Dalacide	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	620	18-20	TL_m	48 hr.	546	soft water
Dalapon	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	> 500	18-20	TL_m	24 hr.	546	hard water
Dalapon	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	> 500	18-20	TL_m	48 hr.	546	hard water
Dalapon	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	49	18-20	TL_m	24 hr.	546	soft water
Dalapon	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	44	18-20	TL_m	48 hr.	546	soft water
Dalapon	Stonefly <u>P. californica</u>	lab	death	no apparent effect	15.5	LC_{50}	24 hr.	687	
Dalapon	Stonefly <u>P. californica</u>	lab	death	no apparent effect	15.5	LC_{50}	48 hr.	687	
Dalapon	Stonefly <u>P. californica</u>	lab	death	no apparent effect	15.5	LC_{50}	96 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [illegible]	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
D. B. granular	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	2,300	18-20	TL_m	24 hr.	546	hard water
D. B. granular	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	2,050	18-20	TL_m	48 hr.	546	hard water
DDT	Brown trout <u>Salmo trutta</u>	lab	death	0.0042	18-20	TL_m	24 hr.	546	hard water
DDT	Brown trout <u>Salmo trutta</u>	lab	death	0.0025	18-20	TL_m	48 hr.	546	hard water
DDT	Brown trout <u>Salmo trutta</u>	lab	death	0.016	18-20	TL_m	24 hr.	546	
DDT	Brown trout <u>Salmo trutta</u>	lab	death	0.011	18-20	TL_m	48 hr.	546	
DDT	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	0.0038	18-20	TL_m	24 hr.	546	hard water
DDT	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	0.0031	18-20	TL_m	48 hr.	546	hard water
DDT	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	0.0014	18-20	TL_m	24 hr.	546	soft water
DDT	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	0.00054	18-20	TL_m	48 hr.	546	soft water
DDT	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	0.02	18-20	TL_m	24 hr.	546	
DDT	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	0.017	18-20	TL_m	48 hr.	546	
DDT	Red crawfish <u>Procamburus clarki</u>	lab	death	0.6	16-32	TL_m	24 hr.	904	
DDT	Red crawfish <u>Procamburus clarki</u>	lab	death	0.6	16-32	TL_m	48 hr.	904	
DDT	Red crawfish <u>Procamburus clarki</u>	lab	death	0.6	16-32	TL_m	72 hr.	904	
DDT	Stonefly <u>P. californica</u>	lab	death	0.041	15.5	LC_{50}	24 hr.	687	

Stimulus	Organism	Experimental Data	Response	Stimulus [illegible]	Temp[illegible]	[illegible]	Rate Effect	Ref.	Remarks
DDT	Stonefly P. californica	lab	death	0.019	15.5	LC_{50}	48 hr.	687	
DDT	Stonefly P. californica	lab	death	0.007	15.5	LC_{50}	96 hr.	687	
DDT	Stonefly P. badia	lab	death	0.012	15.5	LC_{50}	24 hr.	687	
DDT	Stonefly P. badia	lab	death	0.009	15.5	LC_{50}	48 hr.	687	
DDT	Stonefly P. badia	lab	death	0.0019	15.5	LC_{50}	96 hr.	687	
De De Tane liquid	Harlequin fish Rasbora heteromorpha	lab	death	0.16	18-20	TL_m	24 hr.	546	soft water
De De Tane liquid	Harlequin fish Rasbora heteromorpha	lab	death	0.11	18-20	TL_m	48 hr.	546	soft water
De De Tane paste	Harlequin fish Rasbora heteromorpha	lab	death	10.7	18-20	TL_m	24 hr.	546	soft water
De De Tane paste	Harlequin fish Rasbora heteromorpha	lab	death	--	18-20	TL_m	48 hr.	546	soft water
De De Tane 25	Harlequin fish Rasbora heteromorpha	lab	death	0.14	18-20	TL_m	24 hr.	546	soft water
De De Tane 25	Harlequin fish Rasbora heteromorpha	lab	death	0.11	18-20	TL_m	48 hr.	546	soft water
De De Tane wettable	Harlequin fish Rasbora heteromorpha	lab	death	14.2	18-20	TL_m	24 hr.	546	soft water
De De Tane wettable	Harlequin fish Rasbora heteromorpha	lab	death	8.[illegible]	18-20	TL_m	48 hr.	546	soft water
De De Tane wettable	Harlequin fish Rasbora heteromorpha	lab	death	0.01	18-20	TL_m	24 hr.	546	soft water
De De Tane wettable	Harlequin fish Rasbora heteromorpha	lab	death	0.001	18-20	TL_m	48 hr.	546	soft water
DEF	Stonefly P. californica	lab	death	3.80	15.5	LC_{50}	24 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
DEF	Stonefly P. californica	lab	death	2.80	15.5	LC_{50}	48 hr.	687	
DEF	Stonefly P. californica	lab	death	2.10	15.5	LC_{50}	96 hr.	687	
Dexon	Stonefly P. californica	lab	death	66	15.5	LC_{50}	24 hr.	687	
Dexon	Stonefly P. californica	lab	death	42	15.5	LC_{50}	48 hr.	687	
Dexon	Stonefly P. californica	lab	death	24	15.5	LC_{50}	96 hr.	687	
Diazinon	Stonefly P. californica	lab	death	0.155	15.5	LC_{50}	24 hr.	687	
Diazinon	Stonefly P. californica	lab	death	0.060	15.5	LC_{50}	48 hr.	687	
Diazinon	Stonefly P. californica	lab	death	0.025	15.5	LC_{50}	96 hr.	687	
Dibrom	Red crawfish Procamburus clarki	lab	death	6.0	16-32	TL_m	24 hr.	904	
Dibrom	Red crawfish Procamburus clarki	lab	death	4.0	16-32	TL_m	48 hr.	904	
Dibrom	Red crawfish Procamburus clarki	lab	death	4.0	16-32	TL_m	96 hr	904	
Dichlobenil	Stonefly P. californica	lab	death	42	15.5	LC_{50}	24 hr.	687	
Dichlobenil	Stonefly P. californica	lab	death	8.4	15.5	LC_{50}	48 hr.	687	
Dichlobenil	Stonefly P. californica	lab	death	7.00	15.5	LC_{50}	96 hr.	687	
Dichlone	Rainbow trout Salmo gairdnerii	lab	death	0.34	18-20	TL_m	24 hr.	546	
Dichlone	Rainbow trout Salmo gairdnerii	lab	death	0.31	18-20	TL_m	48 hr.	546	

Stimulus	Organism	Experimental Habitat	Response	Stimulus |C| mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Dichloryos	Stonefly *P. californica*	lab	death	0.025	15.5	LC_{50}	24 hr.	687	
Dichloryos	Stonefly *P. californica*	lab	death	0.010	15.5	LC_{50}	48 hr.	687	
Dichloryos	Stonefly *P. californica*	lab	death	0.00010	15.5	LC_{50}	96 hr.	687	
Dieldrin	Stonefly *P. californica*	lab	death	0.006	15.5	LC_{50}	24 hr.	687	
Dieldrin	Stonefly *P. californica*	lab	death	0.0013	15.5	LC_{50}	48 hr.	687	
Dieldrin	Stonefly *P. californica*	lab	death	0.0005	15.5	LC_{50}	96 hr.	687	
Difolatan	Harlequin fish *Rasbora heteromorpha*	lab	death	0.032	18-20	TL_m	24 hr.	546	
Difolatan	Harlequin fish *Rasbora heteromorpha*	lab	death	0.017	18-20	TL_m	48 hr.	546	
Difolatan	Stonefly *P. californica*	lab	death	0.48	15.5	LC_{50}	24 hr.	687	
Difolatan	Stonefly *P. californica*	lab	death	0.15	15.5	LC_{50}	48 hr.	687	
Difolatan	Stonefly *P. californica*	lab	death	0.04	15.5	LC_{50}	96 hr.	687	
Dimethoate	Stonefly *P. californica*	lab	death	0.510	15.5	LC_{50}	24 hr.	687	
Dimethoate	Stonefly *P. californica*	lab	death	0.140	15.5	LC_{50}	48 hr.	687	
Dimethoate	Stonefly *P. californica*	lab	death	0.043	15.5	LC_{50}	96 hr.	687	
Dinitrocresol	Stonefly *P. californica*	lab	death	0.82	15.5	LC_{50}	24 hr.	687	
Dinitrocresol	Stonefly *P. californica*	lab	death	0.56	15.5	LC_{50}	48 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Dinitrocresol	Stonefly P. californica	lab	death	0.32	15.5	LC_{50}	96 hr.	687	
Dipterex	Fathead minnow Pimephales promelas	lab	death	1800	25	TL_m	24 hr.	1187	soft water
Dipterex	Fathead minnow Pimephales promelas	lab	death	1000	25	TL_m	48 hr.	1187	soft water
Dipterex	Fathead minnow Pimephales promelas	lab	death	180	25	TL_m	96 hr.	1187	soft water
Dipterex	Fathead minnow Pimephales promelas	lab	death	560	25	TL_m	24 hr.	1187	hard water
Dipterex	Fathead minnow Pimephales promelas	lab	death	180	25	TL_m	48 hr.	1187	hard water
Dipterex	Fathead minnow Pimephales promelas	lab	death	51	25	TL_m	96 hr.	1187	hard water
Diquat	Striped bass Roccus saxatilis	lab	death	210	21	LC_{16}	24 hr.	307	
Diquat	Striped bass Roccus saxatilis	lab	death	100	21	LC_{16}	48 hr.	307	
Diquat	Striped bass Roccus saxatilis	lab	death	70	21	LC_{16}	96 hr.	307	
Diquat	Striped bass Roccus saxatilis	lab	death	315	21	LC_{50}	24 hr.	307	
Diquat	Striped bass Roccus saxatilis	lab	death	155	21	LC_{50}	48 hr.	307	
Diquat	Striped bass Roccus saxatilis	lab	death	80	21	LC_{50}	96 hr.	307	
Diquat-dibromide	Rainbow trout Salmo gairdnerii	lab	death	90	18-20	TL_m	24 hr.	546	
Diquat-dibromide	Rainbow trout Salmo gairdnerii	lab	death	70	18-20	TL_m	48 hr.	546	
Disulfoton	Stonefly P. californica	lab	death	0.04	15.5	LC_{50}	24 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Concentration [illegible]	Temperature [illegible]	Site of Function	Rate Effect	Ref. No.	Remarks
Disulfoton	Stonefly <u>P. californica</u>	lab	death	0.018	15.5	LC_{50}	48 hr.	687	
Disulfoton	Stonefly <u>P. californica</u>	lab	death	0.005	15.5	LC_{50}	96 hr.	687	
Diuron	Stonefly <u>P. californica</u>	lab	death	3.60	15.5	LC_{50}	24 hr.	687	
Diuron	Stonefly <u>P. californica</u>	lab	death	2.80	15.5	LC_{50}	48 hr.	687	
Diuron	Stonefly <u>P. californica</u>	lab	death	1.20	15.5	LC_{50}	96 hr.	687	
Dowpon	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	300	18-20	TL_m	24 hr.	546	
Dowpon	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	240	18-20	TL_m	48 hr.	546	
Dowpon	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	340	18-20	TL_m	24 hr.	546	
Dowpon	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	210	18-20	TL_m	48 hr.	546	
Dursban	Stonefly <u>P. badia</u>	lab	death	0.0042	15.5	LC_{50}	24 hr.	687	
Dursban	Stonefly <u>P. badia</u>	lab	death	0.0018	15.5	LC_{50}	48 hr.	687	
Dursban	Stonefly <u>P. badia</u>	lab	death	0.00038	15.5	LC_{50}	96 hr.	687	
Dursban	Stonefly <u>C. sabulosa</u>	lab	death	0.0082	15.5	LC_{50}	24 hr.	687	
Dursban	Stonefly <u>C. sabulosa</u>	lab	death	0.0018	15.5	LC_{50}	48 hr.	687	
Dursban	Stonefly <u>C. sabulosa</u>	lab	death	0.00057	15.5	LC_{50}	96 hr.	687	
Dursban	Stonefly <u>P. californica</u>	lab	death	0.[illegible]	15.5	LC_{50}	24 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [illegible]	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Dursban	Stonefly <u>P. californica</u>	lab	death	0.018	15.5	LC_{50}	48 hr.	687	
Dursban	Stonefly <u>P. californica</u>	lab	death	0.010	15.5	LC_{50}	96 hr.	687	
Dylox	Striped bass <u>Roccus saxatilis</u>	lab	death	5.4	21	LC_{16}	24 hr.	307	
Dylox	Striped bass <u>Roccus saxatilis</u>	lab	death	4.8	21	LC_{16}	48 hr.	307	
Dylox	Striped bass <u>Roccus saxatilis</u>	lab	death	3.2	21	LC_{16}	96 hr.	307	
Dylox	Striped bass <u>Roccus saxatilis</u>	lab	death	10.4	21	LC_{50}	24 hr.	307	
Dylox	Striped bass <u>Roccus saxatilis</u>	lab	death	9.2	21	LC_{50}	48 hr.	307	
Dylox	Striped bass <u>Roccus saxatilis</u>	lab	death	5.2	21	LC_{50}	96 hr.	307	
EC - 90	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	2.2	18-20	TL_m	24 hr.	546	hard water
EC - 90	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	1.2	18-20	TL_m	48 hr.	546	hard water
EC - 90	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	1.5	18-20	TL_m	24 hr.	546	soft water
EC - 90	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	1.2	18-20	TL_m	48 hr.	546	soft water
Emcol H-146	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	9.5	18-20	TL_m	24 hr.	546	
Emcol H-146	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	7.2	18-20	TL_m	48 hr.	546	
Emcol H-500x	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	9.5	18-20	TL_m	24 hr.	546	
Emcol H-500x	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	7.2	18-20	TL_m	48 hr.	546	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [illegible] mg/l	Temp. Range studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Emcol 702	Harlequin fish Rasbora heteromorpha	lab	death	8.0	18-20	TL_m	24 hr.	546	
Emcol 702	Harlequin fish Rasbora heteromorpha	lab	death	6.0	18-20	TL_m	48 hr.	546	
Endosulfan	Stonefly P. californica	lab	death	0.024	15.5	LC_{50}	24 hr.	687	
Endosulfan	Stonefly P. californica	lab	death	0.0056	15.5	LC_{50}	48 hr.	687	
Endosulfan	Stonefly P. californica	lab	death	0.0023	15.5	LC_{50}	96 hr.	687	
Endrin	Red crawfish Procamburus clarki	lab	death	0.4	16-32	TL_m	24 hr.	904	
Endrin	Red crawfish Procamburus clarki	lab	death	0.3	16-32	TL_m	48 hr.	904	
Endrin	Red crawfish Procamburus clarki	lab	death	0.3	16-32	TL_m	72 hr.	904	
Endrin	Stonefly P. californica	lab	death	0.004	15.5	LC_{50}	24 hr.	687	
Endrin	Stonefly P. californica	lab	death	0.00096	15.5	LC_{50}	48 hr.	687	
Endrin	Stonefly P. californica	lab	death	0.00025	15.5	LC_{50}	96 hr.	687	
Epichlorbydrin	Harlequin fish Rasbora heteromorpha	lab	death	9.5	18-20	TL_m	24 hr.	546	
Epichlorbydrin	Harlequin fish Rasbora heteromorpha	lab	death	7.2	18-20	TL_m	48 hr.	546	
EPN - 300	Fathead minnow Pimephales promelas	lab	death	2.2	25	TL_m	24 hr.	1187	soft water
EPN - 300	Fathead minnow Pimephales promelas	lab	death	1.5	25	TL_m	48 hr.	1187	soft water
EPN - 300	Fathead minnow Pimephales promelas	lab	death	0.80	25	TL_m	96 hr.	1187	soft water
EPN - 300	Fathead minnow Pimephales promelas	lab	death	1.1	25	TL_m	24 hr.	1187	hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus Conc. mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
EPN - 300	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	1.05	25	TL_m	48 hr.	1187	hard water
EPN - 300	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	1.0	25	TL_m	96 hr.	1187	hard water
Ethion	Stonefly <u>P. californica</u>	lab	death	0.024	15.5	LC_{50}	24 hr.	687	
Ethion	Stonefly <u>P. californica</u>	lab	death	0.014	15.5	LC_{50}	48 hr.	687	
Ethion	Stonefly <u>P. californica</u>	lab	death	0.0028	15.5	LC_{50}	96 hr.	687	
Ethomeen S/25	Harlequin fish <u>Rasbora</u> <u>heteromorpha</u>	lab	death	1.2	18-20	TL_m	24 hr.	546	
Ethomeen S/25	Harlequin fish <u>Rasbora</u> <u>heteromorpha</u>	lab	death	0.68	18-20	TL_m	48 hr.	546	
Ethylbenzene	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	35.08	25	TL_m	24 hr.	1252	soft water
Ethylbenzene	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	32.00	25	TL_m	48 hr.	1252	soft water
Ethylbenzene	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	32.00	25	TL_m	96 hr.	1252	soft water
Ethylbenzene	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	48.51	25	TL_m	24 hr	1252	soft water
Ethylbenzene	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	48.51	25	TL_m	48 hr.	1252	soft water
Ethylbenzene	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	48.51	25	TL_m	96 hr.	1252	soft water
Ethylbenzene	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	42.33	25	TL_m	24 hr.	1252	hard water
Ethylbenzene	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	42.33	25	TL_m	48 hr.	1252	hard water
Ethylbenzene	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	42.33	25	TL_m	96 hr.	1252	hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Ethylbenzene	Goldfish <u>Carassius auratus</u>	lab	death	94.44	25	TL_m	24 hr.	1252	
Ethylbenzene	Goldfish <u>Carassius auratus</u>	lab	death	94.44	25	TL_m	48 hr.	1252	
Ethylbenzene	Goldfish <u>Carassius auratus</u>	lab	death	94.44	25	TL_m	96 hr.	1252	
Ethylbenzene	Guppies <u>Lebistes reticulatus</u>	lab	death	97.10	25	TL_m	24 hr.	1252	
Ethylbenzene	Guppies <u>Lebistes reticulatus</u>	lab	death	97.10	25	TL_m	48 hr.	1252	
Ethylbenzene	Guppies <u>Lebistes reticulatus</u>	lab	death	97.10	25	TL_m	96 hr.	1252	
Fenac	Stonefly <u>P. californica</u>	lab	death	170	15.5	LC_{50}	24 hr.	687	
Fenac	Stonefly <u>P. californica</u>	lab	death	70	15.5	LC_{50}	48 hr.	687	
Fenac	Stonefly <u>P. californica</u>	lab	death	60	15.5	LC_{50}	96 hr.	687	
Fenac - Sodium Salt	Stonefly <u>P. californica</u>	lab	death	220	15.5	LC_{50}	24 hr.	687	
Fenac - Sodium Salt	Stonefly <u>P. californica</u>	lab	death	80	15.5	LC_{50}	48 hr.	687	
Fenac - Sodium Salt	Stonefly <u>P. californica</u>	lab	death	55	15.5	LC_{50}	96 hr.	687	
Finoprop	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	48	18-20	TL_m	24 hr.	546	
Finoprop	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	37	18-20	TL_m	48 hr.	546	
Fluorescein sodium...	Bluegill <u>Lepomis macrochirus</u>	lab	death	5000	12	LC_{50}	24 hr.	288	
Fluorescein sodium...	Bluegill <u>Lepomis macrochirus</u>	lab	death	4898	12	LC_{50}	48 hr.	288	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level	Temp Range Studied °C	Rate Function	Rate Effect	Ref.	Remarks
Fluorescein sodium...	Bluegill *Lepomis macrochirus*	lab	death	3433	12	LC_{50}	96 hr.	288	
Fluorescein sodium...	Channel catfish *Ictalurus punctatus*	lab	death	3828	12	LC_{50}	24 hr.	288	
Fluorescein sodium...	Channel catfish *Ictalurus punctatus*	lab	death	2826	12	LC_{50}	48 hr.	288	
Fluorescein sodium...	Channel catfish *Ictalurus punctatus*	lab	death	2267	12	LC_{50}	96 hr.	288	
Fluorescein sodium...	Rainbow trout *Salmo gairdnerii*	lab	death	4198	12	LC_{50}	24 hr.	288	
Fluorescein sodium...	Rainbow trout *Salmo gairdnerii*	lab	death	3420	12	LC_{50}	48 hr.	288	
Fluorescein sodium...	Rainbow trout *Salmo gairdnerii*	lab	death	1372	12	LC_{50}	96 hr.	288	
Formaldehyde	Brown trout *Salmo trutta*	lab	death	76	18-20	TL_m	24 hr.	546	hard water
Formaldehyde	Brown trout *Salmo trutta*	lab	death	50	18-20	TL_m	48 hr.	546	hard water
Formaldehyde	Rainbow trout *Salmo gairdnerii*	lab	death	76	18-20	TL_m	24 hr.	546	hard water
Formaldehyde	Rainbow trout *Salmo gairdnerii*	lab	death	50	18-20	TL_m	48 hr.	546	hard water
Formalin	Striped bass *Roccus saxatilis*	lab	death	52	21	LC_{16}	24 hr.	307	
Formalin	Striped bass *Roccus saxatilis*	lab	death	20	21	LC_{16}	48 hr.	307	
Formalin	Striped bass *Roccus saxatilis*	lab	death	12	21	LC_{16}	96 hr.	307	
Formalin	Striped bass *Roccus saxatilis*	lab	death	86	21	LC_{50}	24 hr.	307	
Formalin	Striped bass *Roccus saxatilis*	lab	death	32	21	LC_{50}	48 hr.	307	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level mg/l	Temp Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Formalin	Striped bass <u>Roccus saxatilis</u>	lab	death	18	21	LC_{50}	96 hr.	307	
Furfural	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	31	18-20	TL_m	24 hr.	546	
Furfural	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	23	18-20	TL_m	48 hr.	546	
Gramoxone (J. F. 1341)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	430	18-20	TL_m	24 hr.	546	soft water
Gramoxone (J. F. 1341)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	200	18-20	TL_m	48 hr.	546	soft water
Gramoxone (J. F. 1341)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	840	18-20	TL_m	24 hr.	546	hard water
Gramoxone (J. F. 1341)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	570	18-20	TL_m	48 hr.	546	hard water
Gramoxone W (J. F. 1137)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	23	18-20	TL_m	24 hr.	546	hard water
Gramoxone W (J. F. 1137)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	17	18-20	TL_m	48 hr.	546	hard water
Gramoxone W (J. F. 1137)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	64	18-20	TL_m	24 hr.	546	soft water
Gramoxone W (J. F. 1137)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	46	18-20	TL_m	48 hr.	546	soft water
Guthion	Stonefly <u>P. californica</u>	lab	death	0.025	15.5	LC_{50}	24 hr.	687	
Guthion	Stonefly <u>P. californica</u>	lab	death	0.008	15.5	LC_{50}	48 hr.	687	
Guthion	Stonefly <u>P. californica</u>	lab	death	0.0015	15.5	LC_{50}	96 hr.	687	
Heptachlor	Stonefly <u>P. californica</u>	lab	death	0.008	15.5	LC_{50}	24 hr.	687	
Heptachlor	Stonefly <u>P. californica</u>	lab	death	0.0056	15.5	LC_{50}	48 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level (mg/l)	Temp. Range Studied (°C)	Rate Function	Rate Effect	Ref. No.	Remarks	
Heptachlor	Stonefly *P. californica*	lab	death	0.0011	15.5	LC_{50}	96 hr.	687	pH	unionized H_2S
H_2S	Bluegill *Lepomis macrochirus*	lab	death	1.17	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	6.8	0.5
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	1.17	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	6.8	0.5
H_2S	Bluegill *Lepomis macrochirus*	lab	death	1.36	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	6.8	0.6
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	1.36	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	6.8	0.6
H_2S	Bluegill *Lepomis macrochirus*	lab	death	1.59	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	6.8	0.7
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	1.59	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	6.8	0.7
H_2S	Bluegill *Lepomis macrochirus*	lab	death	1.82	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	6.8	0.8
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	1.82	25-30	amount of dead fish per total fish	5 dead/10 fish total	475	6.8	0.8
H_2S	Bluegill *Lepomis macrochirus*	lab	death	2.04	25-30	amount of dead fish per total fish	2 dead/10 fish total	475	6.8	0.9
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	2.04	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	6.8	0.9
H_2S	Bluegill *Lepomis macrochirus*	lab	death	1.5	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7	0.5
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	1.5	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7	0.5
H_2S	Bluegill *Lepomis macrochirus*	lab	death	1.8	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7	0.6
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	1.8	25-30	amount of dead fish per total fish	1 dead/10 fish total	475	7	0.6

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks: pH	Remarks: unionized H_2S
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.1	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7	0.7
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	2.1	25-30	amount of dead fish per total fish	6 dead/10 fish total	475	7	0.7
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.4	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7	0.8
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	2.4	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7	0.8
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.7	25-30	amount of dead fish per total fish	3 dead/10 fish total	475	7	0.9
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	2.7	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7	0.9
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.1	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.2	0.5
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	2.1	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.2	0.5
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.5	25-30	amount of dead fish per total fish	1 dead/10 fish total	475	7.2	0.6
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	2.5	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.2	0.6
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.9	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.2	0.7
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	2.9	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.2	0.7
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	3.3	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.2	0.8
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	3.3	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.2	0.8
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	3.7	25-30	amount of dead fish per total fish	1 dead/10 fish total	475	7.2	0.9

Stimulus	Organism	Experimental Habitat	Response	Stimulus mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks pH	Remarks unionized H_2S
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	3.7	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.2	0.9
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.5	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.4	0.4
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	2.5	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.4	0.4
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.9	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.4	0.5
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	2.9	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.4	0.5
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	3.5	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.4	0.6
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	3.5	25-30	amount of dead fish per total fish	4 dead/10 fish total	475	7.4	0.6
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	4.1	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.4	0.7
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	4.1	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.4	0.7
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	4.7	25-30	amount of dead fish per total fish	2 dead/10 fish total	475	7.4	0.8
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	4.7	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.4	0.8
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	3.6	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.6	0.4
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	3.6	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.6	0.4
H_2S	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	4.5	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.6	0.5
H_2S	Channel catfish <u>Ictalurus</u> <u>punctatus</u>	lab	death	4.5	25-30	amount of dead fish per total fish	2 dead/10 fish total	475	7.6	0.5

Stimulus	Organism	Experimental Habitat	Response	Stimulus	Temp Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks (pH)	Remarks (unionized H_2S)
H_2S	Bluegill *Lepomis macrochirus*	lab	death	5.4	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.6	0.6
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	5.4	25-30	amount of dead fish per total fish	1 dead/10 fish total	475	7.6	0.6
H_2S	Bluegill *Lepomis macrochirus*	lab	death	6.3	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7 6	0.7
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	6.3	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.6	0.7
H_2S	Bluegill *Lepomis macrochirus*	lab	death	7.2	25-30	amount of dead fish per total fish	6 dead/10 fish total	475	7.6	0.8
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	7.2	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.6	0.8
H_2S	Bluegill *Lepomis macrochirus*	lab	death	5.5	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.8	0.4
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	5.5	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.8	0.4
H_2S	Bluegill *Lepomis macrochirus*	lab	death	6.8	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.8	0.5
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	6.8	25-30	amount of dead fish per total fish	3 dead/10 fish total	475	7.8	0.5
H_2S	Bluegill *Lepomis macrochirus*	lab	death	8.2	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.8	0.6
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	8.2	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.8	0.6
H_2S	Bluegill *Lepomis macrochirus*	lab	death	9.6	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.8	0.7
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	9.6	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.8	0.7
H_2S	Bluegill *Lepomis macrochirus*	lab	death	10.9	25-30	amount of dead fish per total fish	0 dead/10 fish total	475	7.8	0.8
H_2S	Channel catfish *Ictalurus punctatus*	lab	death	10.9	25-30	amount of dead fish per total fish	10 dead/10 fish total	475	7.8	0.8

Stimulus	Organism	Experimental Habitat	Response	Stimulus Conc. mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Ialine brushwood killer	Rainbow trout *Salmo gairdnerii*	lab	death	47	18-20	TL_m	24 hr.	546	
Ialine brushwood killer	Rainbow trout *Salmo gairdnerii*	lab	death	27	18-20	TL_m	48 hr.	546	
Ialine (Regulox) grass growth regulator	Rainbow trout *Salmo gairdnerii*	lab	death	85	18-20	TL_m	24 hr.	546	
Ialine (Regulox) grass growth regulator	Rainbow trout *Salmo gairdnerii*	lab	death	56	18-20	TL_m	48 hr.	546	
Isoprene	Bluegill *Lepomis macrochirus*	lab	death	42.54	25	TL_m	24 hr.	1252	
Isoprene	Bluegill *Lepomis macrochirus*	lab	death	42.54	25	TL_m	48 hr.	1252	
Isoprene	Bluegill *Lepomis macrochirus*	lab	death	42.54	25	TL_m	96 hr.	1252	
Isoprene	Fathead minnow *Pimephales promelas*	lab	death	86.51	25	TL_m	24 hr.	1252	soft water
Isoprene	Fathead minnow *Pimephales promelas*	lab	death	86.51	25	TL_m	48 hr.	1252	soft water
Isoprene	Fathead minnow *Pimephales promelas*	lab	death	86.51	25	TL_m	96 hr.	1252	soft water
Isoprene	Fathead minnow *Pimephales promelas*	lab	death	74.83	25	TL_m	24 hr.	1252	hard water
Isoprene	Fathead minnow *Pimephales promelas*	lab	death	74.83	25	TL_m	48 hr.	1252	hard water
Isoprene	Fathead minnow *Pimephales promelas*	lab	death	74.83	25	TL_m	96 hr.	1252	hard water
Isoprene	Goldfish *Carassius auratus*	lab	death	180.00	25	TL_m	24 hr.	1252	
Isoprene	Goldfish *Carassius auratus*	lab	death	180.00	25	TL_m	48 hr.	1252	
Isoprene	Goldfish *Carassius auratus*	lab	death	180.00	25	TL_m	96 hr.	1252	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks	
Isoprene	Guppies *Lebistes reticulatus*	lab	death	240.00	25	TL_m	24 hr.	1252		
Isoprene	Guppies *Lebistes reticulatus*	lab	death	240.00	25	TL_m	48 hr.	1252		
Isoprene	Guppies *Lebistes reticulatus*	lab	death	240.00	25	TL_m	96 hr.	1252		
Isobornyl thiocyanoacetate	Black bullhead *Ameiurus melas*	lab	death	> 1.5	11	TL_{100}	24 hr.	430		
Isobornyl thiocyanoacetate	Bluegill *Lepomis macrochirus*	lab	death	0.4	11	TL_{100}	24 hr.	430		
Isobornyl thiocyanoacetate	Channel catfish *Ictalurus punctatus*	lab	death	1.5	11	TL_{100}	24 hr.	430		
Isobornyl thiocyanoacetate	Golden shiner *Notemigonus crysoleucas*	lab	death	1.5	11	TL_{100}	24 hr.	430		
Isobornyl thiocyanoacetate	Crawfish	Fountain Bluff Pond # 20	death	0.7	87°F	total number killed	See Remarks	430	# killed chemical 0	# obtained poison or draining numerous
Isobornyl thiocyanoacetate	Green sunfish *Lepomis cyanellus*	lab	death	.6	11	TL_{100}	24 hr.	430		
Isobornyl thiocyanoacetate	Large mouth bass *Micropterus salmoides*	Fountain Bluff Pond # 20	death	0.7	87°F	total number killed	See Remarks	430	11	0
Isobornyl thiocyanoacetate	Mosquito fish	Fountain Bluff Pond # 20	death	0.7	87°F	total number killed	See Remarks	430	0	numerous
Isobornyl thiocyanoacetate	Rainbow trout *Salmo gairdnerii*	lab	death	> .7	11	TL_{100}	24 hr.	430		
Isobornyl thiocyanoacetate	Redear sunfish *Lepomis microlophus*	Moroni's bass pond	death	1.5	50°F	total number killed	See Remarks	430	numerous	0
Isobornyl thiocyanoacetate	Tadpoles	Fountain Bluff Pond # 20	death	0.7	87°F	total number killed	See Remarks	430	0	numerous
Isobornyl thiocyanoacetate	White crappie *Pomoxis annularis*	Pierce Pond	death	1.5	80°F	total number killed	See Remarks	430	numerous	0
Isobornyl thiocyanoacetate	Black bullhead *Ameiurus melas*	Fountain Bluff Pond # 20	death	0.7	87°F	total number killed	See Remarks	430	1	5

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks # killed chemical	Remarks # obtained poison or draining
Isobornyl thiocyanoacetate	Bluegill Lepomis macrochirus	Fountain Bluff Pond # 21	death	.8	50°F	total number killed	See Remarks	430	6	0
Isobornyl thiocyanoacetate	Channel catfish Ictalurus punctatus	Fountain Bluff Pond # 21	death	.8	50°F	total number killed	See Remarks	430	0	1
Isobornyl thiocyanoacetate	Golden shiner Notemigonus crysoleucas	Fountain Bluff Pond # 20	death	0.7	87°F	total number killed	See Remarks	430	0	numerous
Isobornyl thiocyanoacetate	Green sunfish Lepomis cyanellus	Fountain Bluff Pond # 20	death	0.7	87°F	total number killed	See Remarks	430	17	1
Isobornyl thiocyanoacetate	Large mouth bass Micropterus salmoides	Fountain Bluff Pond # 21	death	.8	50°F	total number killed	See Remarks	430	4	0
Isobornyl thiocyanoacetate	Mosquito fish	Fountain Bluff Pond # 21	death	.8	50°F	total number killed	See Remarks	430	numerous	numerous
Isobornyl thiocyanoacetate	Black bullhead Ameiurus melas	Pierce Pond	death	1.5	80°F	total number killed	See Remarks	430	numerous	numerous
Isobornyl thiocyanoacetate	Channel catfish Ictalurus punctatus	Moroni's Pond # 1	death	1.5	68°F	total number killed	See Remarks	430	3	11
Isobornyl thiocyanoacetate	Golden shiner Notemigonus crysoleucas	Fountain Bluff Pond # 21	death	.8	50°F	total number killed	See Remarks	430	few	> 500
Isobornyl thiocyanoacetate	Green sunfish Lepomis cyanellus	Moroni's Pond #1	death	1.5	68°F	total number killed	See Remarks	430	numerous	0
Isobornyl thiocyanoacetate	Large mouth bass Micropterus salmoides	Moroni's Pond # 1	death	1.5	68°F	total number killed	See Remarks	430	70	0
Isobornyl thiocyanoacetate	Channel catfish Ictalurus punctatus	Moroni's bass pond	death	1.5	50°F	total number killed	See Remarks	430	7	12
Isobornyl thiocyanoacetate	Golden shiner Notemigonus crysoleucas	Brown's Pond	death	.8	58°F	total number killed	See Remarks	430	< 100	numerous
Isobornyl thiocyanoacetate	Golden shiner Notemigonus crysoleucas	Moroni's bass pond	death	1.5	50°F	total number killed	See Remarks	430	few	numerous
Isobornyl thiocyanoacetate	Green sunfish Lepomis cyanellus	Brown's Pond	death	.8	58°F	total number killed	See Remarks	430	numerous	0
Isobornyl thiocyanoacetate	Large mouth bass Micropterus salmoides	Moroni's bass pond	death	1.5	50°F	total number killed	See Remarks	430	121	0

Stimulus	Organism	Experimental Habitat	Response	Stimulus [illegible]	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Isobornyl thiocyanoacetate	Large mouth bass *Micropterus salmoides*	Pierce Pond	death	1.5	80°F	total number killed	See Remarks	430	# killed chemical 2; # obtained poison or draining 0
Karmex	Striped bass *Roccus saxatilis*	lab	death	--	21	LC_{16}	24 hr.	307	
Karmex	Striped bass *Roccus saxatilis*	lab	death	--	21	LC_{16}	48 hr.	307	
Karmex	Striped bass *Roccus saxatilis*	lab	death	2.0	21	LC_{16}	96 hr.	307	
Karmex	Striped bass *Roccus saxatilis*	lab	death	--	21	LC_{50}	24 hr.	307	
Karmex	Striped bass *Roccus saxatilis*	lab	death	--	21	LC_{50}	48 hr.	307	
Karmex	Striped bass *Roccus saxatilis*	lab	death	3.1	21	LC_{50}	96 hr.	307	
Karathane wettable	Harlequin fish *Rasbora heteromorpha*	lab	death	0.56	18-20	TL_m	24 hr.	546	
Karathane wettable	Harlequin fish *Rasbora heteromorpha*	lab	death	0.44	18-20	TL_m	48 hr.	546	DO (Dissolved Oxygen)
LAS	Bluegill *Lepomis macrochirus*	lab	death	2.2	24.0	TL_m	24 hr.	1076	7.5 mg/L
LAS	Bluegill *Lepomis macrochirus*	lab	death	2.1	25.5	TL_m	24 hr.	1076	7.2 mg/L
LAS	Bluegill *Lepomis macrochirus*	lab	death	2.0	25.2	TL_m	24 hr.	1076	4.7 mg/L
LAS	Bluegill *Lepomis macrochirus*	lab	death	0.5	25.7	TL_m	24 hr.	1076	2.8 mg/L
LAS	Bluegill *Lepomis macrochirus*	lab	death	0.4	25.2	TL_m	24 hr.	1076	2.0 mg/L
LAS	Bluegill *Lepomis macrochirus*	lab	death	0.2	25.8	TL_m	24 hr.	1076	1.9 mg/L
LAS	Bluegill fingerlings *Lepomis macrochirus*	lab	death	3.0	24.8	TL_m	24 hr.	1076	7.6 mg/L

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level	Temp Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	3.2	25.4	TL_m	24 hr.	1076	DO (Dissolved Oxygen) 4.7 mg/L
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	3.1	25.4	TL_m	24 hr.	1076	3.3 mg/L
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	1.8	25.3	TL_m	24 hr.	1076	1.7 mg/L
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	2.9	15.5	TL_m	24 hr.	1076	8.2 mg/L
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	3.2	15.5	TL_m	24 hr.	1076	8.2 mg/L
LAS	Bluegill Lepomis macrochirus	lab	death	2.2	24	TL_m	48 hr.	1076	7.5 mg/L
LAS	Bluegill Lepomis macrochirus	lab	death	2.1	25.5	TL_m	48 hr.	1076	7.2 mg/L
LAS	Bluegill Lepomis macrochirus	lab	death	1.9	25.2	TL_m	48 hr.	1076	4.7 mg/L
LAS	Bluegill Lepomis macrochirus	lab	death	0.5	25.7	TL_m	48 hr.	1076	2.8 mg/L
LAS	Bluegill Lepomis macrochirus	lab	death	0.4	25.2	TL_m	48 hr.	1076	2.0 mg/L
LAS	Bluegill Lepomis macrochirus	lab	death	--	25.8	TL_m	48 hr.	1076	1.9 mg/L
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	3.0	24.8	TL_m	48 hr.	1076	7.6 mg/L
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	2.4	25.5	TL_m	48 hr.	1076	4.7 mg/L
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	3.0	25.4	TL_m	48 hr.	1076	3.3 mg/L
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	1.8	25.3	TL_m	48 hr.	1076	1.7 mg/L
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	2.3	15.5	TL_m	48 hr.	1076	8.2 mg/L

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks	
LAS	Bluegill fingerlings <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.6	15.5	TL_m	48 hr.	1076	DO 8.2 mg/L	
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	> 5.6	20.5-22.0	TL_m	1 day	1076	DO 7.4-8.6 mg/L	Source Carl's Lake Lot 1
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	5.1	21.0-22.0	TL_m	1 day	1076	7.2-8.0 mg/L	Carl's Lake Lot 2
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	5.1	--	TL_m	1 day	1076	--	Carl's Lake Lot 1
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	3.4	--	TL_m	1 day	1076	7.0-8.2 mg/L	Carl's Lake Lot 2
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	> 5.4	20-23	TL_m	1 day	1076	6.9-8.0 mg/L	Lake Minnetonka
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	4.[illegible]	20.5-22	TL_m	2 days	1076	7.4-8.6 mg/L	Carl's Lake Lot 1
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	5.0	21-22	TL_m	2 days	1076	7.2-8.0 mg/L	Carl's Lake Lot 2
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	4.1	--	TL_m	2 days	1076	--	Carl's Lake Lot 3
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	3.2	21.0-22	TL_m	2 days	1076	7.0-8.2 mg/L	Carl's Lake Lot 2
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	> 5.4	20-23	TL_m	2 days	1076	6.9-8.0 mg/L	Lake Minnetonka
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	5.0	-	TL_m	3 days	1076	--	--
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	4.9	--	TL_m	4 days	1076	--	--
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	4.0	--	TL_m	5 days	1076	--	--
LAS	Bluegill sac-fry <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.3	--	TL_m	6 days	1076	--	--
LAS	Bluegill fingerlings <u>Lepomis</u> <u>macrochirus</u>	lab	death	2.1	15.5	TL_m	72 hr.	1076	8.2 mg/L	NA

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	2.[illegible]	--	TL_m	72 hr.	1076	
LAS	Bluegill fingerlings Lepomis macrochirus	lab	death	2.1	-	TL_m	96 hr.	1076	
LAS	Fathead minnow Pimephales promelas	lab	death	3.4	21±1	TL_m	1 day	1192	rate function is a graphical interpolation
LAS	Fathead minnow Pimephales promelas	lab	death	[illegible].1	21±1	TL_m	2 days	1192	rate function is a graphical interpolation
LAS	Fathead minnow Pimephales promelas	lab	death	2.8	21±1	TL_m	3 days	1192	rate function is a graphical interpolation
LAS	Fathead minnow Pimephales promelas	lab	death	2.[illegible]	21±1	TL_m	4 days	1192	rate function is a graphical interpolation
LAS	Fathead minnow Pimephales promelas	lab	death	2.[illegible]	21±1	TL_m	5 days	1192	rate function is a graphical interpolation
LAS	Fathead minnow Pimephales promelas	lab	death	2.[illegible]	21±1	TL_m	[illegible] days	1192	rate function is a graphical interpolation
LAS	Fathead minnow Pimephales promelas	lab	death	2[illegible]	21[illegible]	TL_m	[illegible] days	1192	rate function is a graphical interpolation
LAS	Fathead minnow Pimephales promelas	lab	death	2.4	21±1	TL_m	8 days	1192	rate function is a graphical interpolation
LAS	Fathead minnow Pimephales promelas	lab	death	2.3	21±1	TL_m	9 days	1192	rate function is a graphical interpolation
Lead	Goldfish Carassius auratus	lab	death	110.0	19-25	LC_{50}	7 days	1017	
Lead	Goldfish Carassius auratus	lab	death	60.0	19-25	LC_1	7 days	1017	
Lead w/o calcium carbonate	Goldfish Carassius auratus	lab	death	6.6	19-25	LC_{50}	7 days	1017	
Lead w/ calcium carbonate	Goldfish Carassius auratus	lab	death	1.5	19-25	LC_1	7 days	1017	
Lead acetate	Fathead minnow Pimephales promelas	lab	death	14.6	25	TL_m	24 hr.	1130	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [illegible]	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No	Remarks
Lead acetate	Fathead minnow Pimephales promelas	lab	death	10.4	25	TL_m	48 hr.	1130	
Lead acetate	Fathead minnow Pimephales promelas	lab	death	7.48	25	TL_m	96 hr.	1130	
Lead chloride	Bluegill Lepomis macrochirus	lab	death	25.9	25	TL_m	24 hr.	1130	
Lead chloride	Bluegill Lepomis macrochirus	lab	death	24.5	25	TL_m	48 hr.	1130	
Lead chloride	Bluegill Lepomis macrochirus	lab	death	23.8	25	TL_m	96 hr.	1130	
Lead chloride	Bluegill Lepomis macrochirus	lab	death	482.	25	TL_m	24 hr.	1130	
Lead chloride	Bluegill Lepomis macrochirus	lab	death	463.	25	TL_m	48 hr.	1130	
Lead chloride	Bluegill Lepomis macrochirus	lab	death	442.	25	TL_m	96 hr.	1130	
Lead chloride	Fathead minnow Pimephales promelas	lab	death	8.18	25	TL_m	24 hr.	1130	
Lead chloride	Fathead minnow Pimephales promelas	lab	death	5.99	25	TL_m	48 hr.	1130	
Lead chloride	Fathead minnow Pimephales promelas	lab	death	5.58	25	TL_m	96 hr.	1130	
Lead chloride	Fathead minnow Pimephales promelas	lab	death	11.5	25	TL_m	24 hr.	1130	
Lead chloride	Fathead minnow Pimephales promelas	lab	death	11.5	25	TL_m	48 hr.	1130	
Lead chloride	Fathead minnow Pimephales promelas	lab	death	7.33	25	TL_m	96 hr.	1130	
Lead chloride	Fathead minnow Pimephales promelas	lab	death	482.	25	TL_m	24 hr.	1130	
Lead chloride	Fathead minnow Pimephales promelas	lab	death	482.	25	TL_m	48 hr.	1130	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C]	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Lead chloride	Fathead minnow <u>Pimephales promelas</u>	lab	death	482.	25	TL_m	96 hr.	1130	
Lead chloride	Goldfish <u>Carassius auratus</u>	lab	death	45.4	25	TL_m	24 hr.	1130	
Lead chloride	Goldfish <u>Carassius auratus</u>	lab	death	31.5	25	TL_m	48 hr.	1130	
Lead chloride	Goldfish <u>Carassius auratus</u>	lab	death	31.5	25	TL_m	96 hr.	1130	
Lead chloride	Guppies <u>Lebistes reticulatus</u>	lab	death	24.5	25	TL_m	24 hr.	1130	
Lead chloride	Guppies <u>Lebistes reticulatus</u>	lab	death	24.5	25	TL_m	48 hr.	1130	
Lead chloride	Guppies <u>Lebistes reticulatus</u>	lab	death	20.6	25	TL_m	96 hr.	1130	
Lindane	Stonefly <u>P. californica</u>	lab	death	12	15.5	LC_{50}	24 hr.	687	
Lindane	Stonefly <u>P. californica</u>	lab	death	8.0	15.5	LC_{50}	48 hr.	687	
Lindane	Stonefly <u>P. californica</u>	lab	death	4.5	15.5	LC_{50}	96 hr.	687	
Lirostanol	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	0.42	18-20	TL_m	24 hr.	546	
Lirostanol	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	0.22	18-20	TL_m	48 hr.	546	
Lissapol NX	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	3.9	18-20	TL_m	24 hr.	546	
Lissapol NX	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	3.6	18-20	TL_m	48 hr.	546	
Lubrol L	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	17.5	18-20	TL_m	24 hr.	546	hard water
Lubrol L	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	16	18-20	TL_m	48 hr.	546	hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Lubrol L	Harlequin fish *Rasbora heteromorpha*	lab	death	15.5	18-20	TL_m	24 hr.	546	soft water
Lubrol L	Harlequin fish *Rasbora heteromorpha*	lab	death	12.5	18-20	TL_m	48 hr.	546	soft water
Malachite green	Harlequin fish *Rasbora heteromorpha*	lab	death	0.28	18-20	TL_m	24 hr.	546	soft water
Malachite green	Harlequin fish *Rasbora heteromorpha*	lab	death	--	18-20	TL_m	48 hr.	546	soft water
Malachite green	Rainbow trout *Salmo gairdnerii*	lab	death	0.11	18-20	TL_m	24 hr.	546	hard water
Malachite green	Rainbow trout *Salmo gairdnerii*	lab	death	0.09	18-20	TL_m	48 hr.	546	hard water
Malachite green	Harlequin fish *Rasbora heteromorpha*	lab	death	0.46	18-20	TL_m	24 hr.	546	hard water
Malachite green	Harlequin fish *Rasbora heteromorpha*	lab	death	--	18-20	TL_m	48 hr.	546	hard water
Malathion	Daphnia *Daphnia magna* Straus	lab	death	control	19-22	mortality	% dead at 48 hr.	332	% mortality 8.5 ± 3.32
Malathion	Daphnia *Daphnia magna* Straus	lab	death	.0001	19-22	mortality	% dead at 48 hr.	332	10.0 ± 6.71
Malathion	Daphnia *Daphnia magna* Straus	lab	death	.0002	19-22	mortality	% dead at 48 hr.	332	5.0 ± 4.88
Malathion	Daphnia *Daphnia magna* Straus	lab	death	.0004	19-22	mortality	% dead at 48 hr.	332	10.0 ± 6.71
Malathion	Daphnia *Daphnia magna* Straus	lab	death	.0006	19-22	mortality	% dead at 48 hr.	332	20.0 ± 5.97
Malathion	Daphnia *Daphnia magna* Straus	lab	death	.0007	19-22	mortality	% dead at 48 hr.	332	20.0 ± 5.17
Malathion	Daphnia *Daphnia magna* Straus	lab	death	.0008	19-22	mortality	% dead at 48 hr.	332	30.0 ± 5.92

Stimulus	Organism	Experimental Habitat	Response	Stimulus (C) mg/l	Temp Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Malathion	Daphnia Daphnia magna Straus	lab	death	0.001	19-22	mortality	% dead at 48 hr.	332	% mortality 26.7 ± 6.60
Malathion	Daphnia Daphnia magna Straus	lab	death	0.002	19-22	mortality	% dead at 48 hr.	332	60.0 ± 7.30
Malathion	Daphnia Daphnia magna Straus	lab	death	0.003	19-22	mortality	% dead at 48 hr.	332	43.3 ± 9.04
Malathion	Daphnia Daphnia magna Straus	lab	death	0.004	19-22	mortality	% dead at 48 hr.	332	66.7 ± 8.60
Malathion	Daphnia Daphnia magna Straus	lab	death	0.005	19-22	mortality	% dead at 48 hr.	332	86.7 ± 6.20
Malathion	Daphnia Daphnia magna Straus	lab	death	0.01	19-22	mortality	% dead at 48 hr.	332	100.0 ± 0.0
Malathion	Fathead minnow Pimephales promelas	lab	death	25.	25	TL_m	24 hr	1187	soft water
Malathion	Fathead minnow Pimephales promelas	lab	death	23.	25	TL_m	48 hr.	1187	soft water
Malathion	Fathead minnow Pimephales promelas	lab	death	22.	25	TL_m	96 hr.	1187	soft water
Malathion	Fathead minnow Pimephales promelas	lab	death	26.	25	TL_m	24 hr.	1187	hard water
Malathion	Fathead minnow Pimephales promelas	lab	death	23.	25	TL_m	48 hr.	1187	hard water
Malathion	Fathead minnow Pimephales promelas	lab	death	22.	25	TL_m	96 hr.	1187	hard water
Malathion	Stonefly P. badia	lab	death	0.010	15.5	LC_{50}	24 hr.	687	
Malathion	Stonefly P. badia	lab	death	0.006	15.5	LC_{50}	48 hr.	687	
Malathion	Stonefly P. badia	lab	death	0.0011	15.5	LC_{50}	96 hr.	687	
Malathion	Stonefly P. californica	lab	death	0.035	15.5	LC_{50}	24 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level (ppm)	Temp. Range Studied	Rate Function	Rate Effect	Ref No.	Remarks
Malathion	Stonefly <u>P. californica</u>	lab	death	0.020	15.5	LC_{50}	48 hr.	687	
Malathion	Stonefly <u>P. californica</u>	lab	death	0.010	15.5	LC_{50}	96 hr.	687	
Malathion	Stonefly <u>Claassenia sabulosa</u>	lab	death	0.013	15.5	LC_{50}	24 hr.	687	
Malathion	Stonefly <u>Claassenia sabulosa</u>	lab	death	0.006	15.5	LC_{50}	48 hr.	687	
Malathion	Stonefly <u>Claassenia sabulosa</u>	lab	death	0.0028	15.5	LC_{50}	96 hr.	687	
Malathion	Stonefly <u>P. californica</u>	lab	death	0.035	15.5	LC_{50}	24 hr.	687	
Malathion	Stonefly <u>P. californica</u>	lab	death	0.020	15.5	LC_{50}	48 hr.	687	
Malathion	Stonefly <u>P. californica</u>	lab	death	0.010	15.5	LC_{50}	96 hr.	687	
Manoxol	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	66	18-20	TL_m	24 hr.	546	soft water
Manoxol	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	27	18-20	TL_m	48 hr.	546	soft water
Mercury	Goldfish <u>Carassius auratus</u>	lab	death	0.82	19-25	LC_{50}	7 days	1017	
Mercury	Goldfish <u>Carassius auratus</u>	lab	death	0.36	19-25	LC_1	7 days	1017	
Methyl methacrylate	Bluegill <u>Lepomis macrochirus</u>	lab	death	368.1	25	TL_m	24 hr	1252	soft water
Methyl methacrylate	Bluegill <u>Lepomis macrochirus</u>	lab	death	357.5	25	TL_m	48 hr.	1252	soft water
Methyl methacrylate	Bluegill <u>Lepomis macrochirus</u>	lab	death	232.2	25	TL_m	96 hr.	1252	soft water
Methyl methacrylate	Fathead minnow <u>Pimephales promelas</u>	lab	death	421.2	25	TL_m	24 hr.	1252	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus ICI mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	338.2	25	TL_m	48 hr.	1252	soft water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	159.1	25	TL_m	96 hr.	1252	soft water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	455.1	25	TL_m	24 hr.	1252	soft water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	455.1	25	TL_m	48 hr.	1252	soft water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	160.2	25	TL_m	96 hr	1252	soft water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	498.6	25	TL_m	24 hr	1252	hard water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	338.2	25	TL_m	48 hr.	1252	hard water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	311.0	25	TL_m	96 hr	1252	hard water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	391.9	25	TL_m	24 hr	1252	hard water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	368.1	25	TL_m	48 hr.	1252	hard water
Methyl methacrylate	Fathead minnow Pimephales promelas	lab	death	320.0	25	TL_m	96 hr.	1252	hard water
Methyl methacrylate	Goldfish Carassius auratus	lab	death	423.3	25	TL_m	24 hr.	1252	soft water
Methyl methacrylate	Goldfish Carassius auratus	lab	death	423.3	25	TL_m	48 hr.	1252	soft water
Methyl methacrylate	Goldfish Carassius auratus	lab	death	277.1	25	TL_m	96 hr.	1252	soft water
Methyl methacrylate	Guppies Lebistes reticulatus	lab	death	368.1	25	TL_m	24 hr.	1252	soft water
Methyl methacrylate	Guppies Lebistes reticulatus	lab	death	368.1	25	TL_m	48 hr	1252	soft water

Stimulus	Organism	Experimental Habitat	Res[illegible]	Stimulus [illegible]	Range	Rate [illegible]	[illegible]ate Effect	Ref	Remarks
Methyl methacrylate	Guppies <u>Lebistes reticulatus</u>	lab	death	368.1	25	TL_m	96 hr.	1252	soft water
Methyl parathion	Fathead minnow <u>Pimephales promelas</u>	lab	death	12.6	25	TL_m	24 hr.	1187	soft water
Methyl parathion	Fathead minnow <u>Pimephales promelas</u>	lab	death	10.7	25	TL_m	48 hr.	1187	soft water
Methyl parathion	Fathead minnow <u>Pimephales promelas</u>	lab	death	10.4	25	TL_m	96 hr.	1187	soft water
Methyl parathion	Fathead minnow <u>Pimephales promelas</u>	lab	death	13.7	25	TL_m	24 hr.	1187	hard water
Methyl parathion	Fathead minnow <u>Pimephales promelas</u>	lab	death	12.6	25	TL_m	48 hr.	1187	hard water
Methyl parathion	Fathead minnow <u>Pimephales promelas</u>	lab	death	10.4	25	TL_m	96 hr.	1187	hard water
Methyl parathion	Red crawfish <u>Procamburus clarki</u>	lab	death	0.05	16-32	TL_m	24 hr.	904	
Methyl parathion	Red crawfish <u>Procamburus clarki</u>	lab	death	0.04	16-32	TL_m	48 hr.	904	
Methyl parathion	Red crawfish <u>Procamburus clarki</u>	lab	death	0.04	16-32	TL_m	96 hr.	904	
Methoxychlor	Stonefly <u>P. californica</u>	lab	death	0.030	15.5	LC_{50}	24 hr.	687	
Methoxychlor	Stonefly <u>P. californica</u>	lab	death	0.008	15.5	LC_{50}	48 hr.	687	
Methoxychlor	Stonefly <u>P. californica</u>	lab	death	0.0014	15.5	LC_{50}	96 hr.	687	
Molinate	Stonefly <u>P. californica</u>	lab	death	2.30	15.5	LC_{50}	24 hr.	687	
Molinate	Stonefly <u>P. californica</u>	lab	death	0.70	15.5	LC_{50}	48 hr.	687	
Molinate	Stonefly <u>P. californica</u>	lab	death	0.34	15.5	LC_{50}	96 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Monoxone	Rainbow trout *Salmo gairdnerii*	lab	death	2,000	18-20	TL_m	24 hr	546	
Monoxone	Rainbow trout *Salmo gairdnerii*	lab	death	900	18-20	TL_m	48 hr	546	
Monuron	Rainbow trout *Salmo gairdnerii*	lab	death	180	18-20	TL_m	24 hr.	546	
Monuron	Rainbow trout *Salmo gairdnerii*	lab	death	100	18-20	TL_m	48 hr.	546	
Mystox LSC/P	Harlequin fish *Rasbora heteromorpha*	lab	death	28.0	18-20	TL_m	24 hr	546	hard water
Mystox LSC/P	Harlequin fish *Rasbora heteromorpha*	lab	death	18.0	18-20	TL_m	48 hr	546	hard water
Mystox LSC/P	Harlequin fish *Rasbora heteromorpha*	lab	death	7	18-20	TL_m	24 hr	546	soft water
Mystox LSC/P	Harlequin fish *Rasbora heteromorpha*	lab	death	5.6	18-20	TL_m	48 hr	546	soft water
Mystox LSE/L	Rainbow trout *Salmo gairdnerii*	lab	death	68	18-20	TL_m	24 hr.	546	
Mystox LSE/L	Rainbow trout *Salmo gairdnerii*	lab	death	36	18-20	TL_m	48 hr	546	
Mystox LSE/P	Rainbow trout *Salmo gairdnerii*	lab	death	47	18-20	TL_m	24 hr.	546	
Mystox LSE/P	Rainbow trout *Salmo gairdnerii*	lab	death	24	18-20	TL_m	48 hr.	546	
Mystox LSL	Harlequin fish *Rasbora heteromorpha*	lab	death	12.0	18-20	TL_m	24 hr.	546	hard water
Mystox LSL	Harlequin fish *Rasbora heteromorpha*	lab	death	8.2	18-20	TL_m	48 hr.	546	hard water
Mystox LSL	Harlequin fish *Rasbora heteromorpha*	lab	death	3.5	18-20	TL_m	24 hr.	546	soft water
Mystox LSL	Harlequin fish *Rasbora heteromorpha*	lab	death	2.5	18-20	TL_m	48 hr.	546	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level	Temp. Range Studied	Rate Expression	Rate Effect	Ref. No.	Remarks
Mystox LSL/L	Rainbow trout Salmo gairdnerii	lab	death	330	18-20	TL_m	24 hr.	546	
Mystox LSL/L	Rainbow trout Salmo gairdnerii	lab	death	180	18-20	TL_m	48 hr.	546	
Mystox LSL/P	Rainbow trout Salmo gairdnerii	lab	death	80	18-20	TL_m	24 hr.	546	
Mystox LSL/P	Rainbow trout Salmo gairdnerii	lab	death	68	18-20	TL_m	48 hr.	546	
Nalco 201	Harlequin fish Rasbora heteromorpha	lab	death	0.8	18-20	TL_m	24 hr.	546	
Nalco 201	Harlequin fish Rasbora heteromorpha	lab	death	0.76	18-20	TL_m	48 hr.	546	
Nalco 240	Harlequin fish Rasbora heteromorpha	lab	death	9.0	18-20	TL_m	24 hr.	546	
Nalco 240	Harlequin fish Rasbora heteromorpha	lab	death	7.4	18-20	TL_m	48 hr.	546	
Nalco 243	Harlequin fish Rasbora heteromorpha	lab	death	0.33	18-20	TL_m	24 hr.	546	
Nalco 243	Harlequin fish Rasbora heteromorpha	lab	death	0.28	18-20	TL_m	48 hr.	546	
Naled	Stonefly P. californica	lab	death	0.027	15.5	LC_{50}	24 hr.	687	
Naled	Stonefly P. californica	lab	death	0.016	15.5	LC_{50}	48 hr.	687	
Naled	Stonefly P. californica	lab	death	0.08	15.5	LC_{50}	96 hr.	687	
Nematocide 18133	Harlequin fish Rasbora heteromorpha	lab	death	0.11	18-20	TL_m	24 hr.	546	
Nematocide 18133	Harlequin fish Rasbora heteromorpha	lab	death	0.09	18-20	TL_m	48 hr.	546	
Nickelous chloride	Bluegill Lepomis macrochirus	lab	death	41.7	25	TL_m	24 hr.	1130	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Nickelous chloride	Bluegill *Lepomis macrochirus*	lab	death	15.9	25	TL_m	48 hr.	1130	soft water
Nickelous chloride	Bluegill *Lepomis macrochirus*	lab	death	5.18	25	TL_m	96 hr.	1130	soft water
Nickelous chloride	Bluegill *Lepomis macrochirus*	lab	death	11.3	25	TL_m	24 hr.	1130	soft water
Nickelous chloride	Bluegill *Lepomis macrochirus*	lab	death	8.67	25	TL_m	48 hr.	1130	soft water
Nickelous chloride	Bluegill *Lepomis macrochirus*	lab	death	5.36	25	TL_m	96 hr.	1130	soft water
Nickelous chloride	Bluegill *Lepomis macrochirus*	lab	death	not found	25	TL_m	24 hr.	1130	hard water
Nickelous chloride	Bluegill *Lepomis macrochirus*	lab	death	82.1	25	TL_m	48 hr.	1130	hard water
Nickelous chloride	Bluegill *Lepomis macrochirus*	lab	death	39.6	25	TL_m	96 hr.	1130	hard water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	13.5	25	TL_m	24 hr.	1130	soft water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	7.91	25	TL_m	48 hr.	1130	soft water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	5.18	25	TL_m	96 hr.	1130	soft water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	10.4	25	TL_m	24 hr.	1130	soft water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	5.93	25	TL_m	48 hr.	1130	soft water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	4.58	25	TL_m	96 hr.	1130	soft water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	104.	25	TL_m	24 hr.	1130	hard water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	59.3	25	TL_m	48 hr.	1130	hard water

Stimulus	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Remarks
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	42.4	25	TL_m	96 hr.	1130	hard water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	79.1	25	TL_m	24 hr.	1130	hard water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	51.6	25	TL_m	48 hr.	1130	hard water
Nickelous chloride	Fathead minnow *Pimephales promelas*	lab	death	44.5	25	TL_m	96 hr.	1130	hard water
Nickelous chloride	Goldfish *Carassius auratus*	lab	death	34.1	2[illegible]	TL_m	24 hr.	1130	soft water
Nickelous chloride	Goldfish *Carassius auratus*	lab	death	20.[illegible]	25	TL_m	48 hr.	1130	soft water
Nickelous chloride	Goldfish *Carassius auratus*	lab	death	9.82	25	TL_m	96 hr.	1130	soft water
Nickelous chloride	Guppies *Lebistes reticulatus*	lab	death	18.3	25	TL_m	24 hr.	1130	soft water
Nickelous chloride	Guppies *Lebistes reticulatus*	lab	death	9.56	25	TL_m	48 hr.	1130	soft water
Nickelous chloride	Guppies *Lebistes reticulatus*	lab	death	4.45	25	TL_m	96 hr.	1130	soft water
OMPA	Fathead minnow *Pimephales promelas*	lab	death	> 1800	25	TL_m	24 hr.	1187	soft water
OMPA	Fathead minnow *Pimephales promelas*	lab	death	1600	25	TL_m	48 hr.	1187	soft water
OMPA	Fathead minnow *Pimephales promelas*	lab	death	135	25	TL_m	96 hr.	1187	soft water
OMPA	Fathead minnow *Pimephales promelas*	lab	death	> 1800	25	TL_m	24 hr.	1187	hard water
OMPA	Fathead minnow *Pimephales promelas*	lab	death	> 1800	25	TL_m	48 hr.	1187	hard water
OMPA	Fathead minnow *Pimephales promelas*	lab	death	150	25	TL_m	96 hr	1187	hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus |C| mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref No.	Remarks
0-nitro phenol	Bluegill Lepomis macrochirus	lab	death	66.9	20	TL_m	24 hr.	1163	
0-nitro phenol	Bluegill Lepomis macrochirus	lab	death	46.3-51.6	20	TL_m	48 hr.	1163	
o.p. DDT	Harlequin fish Rasbora heteromorpha	lab	death	0.03	18-20	TL_m	24 hr.	546	
o.p. DDT	Harlequin fish Rasbora heteromorpha	lab	death	--	18-20	TL_m	48 hr.	546	
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.79	58.0°F	ppm/lb/gpm	¼ hr.	264	creek
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.39	58.0°F	ppm/lb/gpm	¼ hr	264	control
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.76	58.5°F	ppm/lb/gpm	½ hr	264	creek
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.39	58.5°F	ppm/lb/gpm	½ hr.	264	control
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.70	59.2°F	ppm/lb/gpm	1 hr.	264	creek
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.40	59.2°F	ppm/lb/gpm	1 hr	264	control
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.70	60.1°F	ppm/lb/gpm	2 hr.	264	creek
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.42	60.1°F	ppm/lb/gpm	2 hr.	264	control
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.64	61.4°F	ppm/lb/gpm	3 hr.	264	creek
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.44	61.4°F	ppm/lb/gpm	3 hr	264	control
Oxygen	Chinook salmon Oncorhynchus tshawitsha	lab	oxygen consumption	0.82	62.4°F	ppm/lb/gpm	4 hr.	264	creek

Stimulus	Organism	Experimental Habitat	Response	Stimulus ( )	Temp Range Studied	Rate Factor	Rate Effect	Ref. No	Remarks
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.45	62.4°F	ppm/lb/gpm	4 hr.	264	control
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.65	63.7°F	ppm/lb/gpm	5 hr.	264	creek
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.47	63.7°F	ppm/lb/gpm	5 hr.	264	control
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.72	53.0°F	ppm/lb/gpm	¼ hr.	264	well
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.31	53.0°F	ppm/lb/gpm	¼ hr.	264	control
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.56	53.0°F	ppm/lb/gpm	½ hr.	264	well
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.31	53.0°F	ppm/lb/gpm	½ hr.	264	control
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.48	53.0°F	ppm/lb/gpm	1 hr.	264	well
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.31	53.0°F	ppm/lb/gpm	1 hr.	264	control
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.43	53.0°F	ppm/lb/gpm	2 hr.	264	well
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.31	53.0°F	ppm/lb/gpm	2 hr.	264	control
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.60	53.0°F	ppm/lb/gpm	3 hr.	264	well
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.31	53.0°F	ppm/lb/gpm	3 hr.	264	control
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.66	53.0°F	ppm/lb/gpm	4 hr.	264	well
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.31	53.0°F	ppm/lb/gpm	4 hr.	264	control

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.56	53.0°F	ppm/lb/gpm	5 hr.	264	well
Oxygen	Chinook salmon <u>Oncorhynchus tshawitsha</u>	lab	oxygen consumption	0.31	53.0°F	ppm/lb/gpm	5 hr.	264	control
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	23.8	5	Q_{10}	5-10°C = 4.2	926	stimulus as O_2 uptake in ml/gr/hr
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	47.4	10	Q_{10}	10-15°C = 2.1	926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	68.9	15	Q_{10}	15-20°C = 1.4	926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	80.0	20	Q_{10}		926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	1.46	5	Q_{10}	5-25°C = 1.27	926	stimulus based on diffusion rate D (cm^2/sec x 10^5)
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	1.65	10	Q_{10}		926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	1.85	15	Q_{10}		926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	2.08	20	Q_{10}		926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	0.0429	5	Q_{10}	5-25°C = 1.23	926	stimulus based on absorption coef. α (ml O_2/ml H_2O, 760 mm, PO_2)
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	0.0380	10	Q_{10}		926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	0.0342	15	Q_{10}		926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	0.0310	20	Q_{10}		926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	6.26	5	Q_{10}	5-20°C = 1.05	926	stimulus based on permeation coef. D' = α x 10 (x 10^2)
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	6.27	10	Q_{10}		926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	6.33	15	Q_{10}		926	
Oxygen	Brook trout <u>Salvelinus fontinalis</u>	lab	oxygen consumption	6.45	20	Q_{10}		926	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
O_2	Esox lucius	not available		0.72	15		oxygen threshold	897	
O_2	Esox lucius	not available		1.4	29		oxygen threshold	897	
O_2	Oncorhynchus gorbuscha	not available		1.99	17		oxygen threshold	897	
O_2	Oncorhynchus gorbuscha	not available		3.36	25		oxygen threshold	897	
O_2	Perca fluviatilis	not available		0.4	15		oxygen threshold	897	
O_2	Perca fluviatilis	not available		1.4	25		oxygen threshold	897	
O_2	Rutilus rutilus	not available		0.6	15		oxygen threshold	897	
O_2	Rutilus rutilus	not available		1.6	23		oxygen threshold	897	
O_2	Salmo salar	not available		1.51	15		oxygen threshold	897	
O_2	Salmo salar	not available		2.85	25		oxygen threshold	897	
Oxine-copper	Rainbow trout Salmo gairdnerii	lab	death	0.30	15 and 25	TL_m	24 hr.	546	
Oxine-copper	Rainbow trout Salmo gairdnerii	lab	death	0.14	15 and 25	TL_m	48 hr.	546	
Oxydemetonmethyl	Stonefly P. californica	lab	death	0.960	15.5	LC_{50}	24 hr.	687	
Oxydemetonmethyl	Stonefly P. californica	lab	death	0.150	15.5	LC_{50}	48 hr.	687	
Oxydemetonmethyl	Stonefly P. californica	lab	death	0.035	15.5	LC_{50}	96 hr.	687	
Panacide	Harlequin fish Rasbora heteromorpha	lab	death	0.6	18-20	TL_m	24 hr.	546	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Panacide	Harlequin fish *Rasbora heteromorpha*	lab	death	0.38	18-20	TL_m	48 hr.	546	
Panacide	Rainbow trout *Salmo gairdnerii*	lab	death	0.8	18-20	TL_m	24 hr.	546	
Panacide	Rainbow trout *Salmo gairdnerii*	lab	death	0.54	18-20	TL_m	48 hr.	546	
Paraoxon	Fathead minnow *Pimephales promelas*	lab	death	0.41	25	TL_m	24 hr.	1187	soft water
Paraoxon	Fathead minnow *Pimephales promelas*	lab	death	0.37	25	TL_m	48 hr.	1187	soft water
Paraoxon	Fathead minnow *Pimephales promelas*	lab	death	0.33	25	TL_m	96 hr.	1187	soft water
Paraoxon	Fathead minnow *Pimephales promelas*	lab	death	0.36	25	TL_m	24 hr.	1187	hard water
Paraoxon	Fathead minnow *Pimephales promelas*	lab	death	0.28	25	TL_m	48 hr.	1187	hard water
Paraoxon	Fathead minnow *Pimephales promelas*	lab	death	0.25	25	TL_m	96 hr.	1187	hard water
Paraquat	Stonefly *P. californica*	lab	no apparent effect	100.0	15.5	LC_{50}	24 hr.	687	
Paraquat	Stonefly *P. californica*	lab	no apparent effect	100.0	15.5	LC_{50}	48 hr.	687	
Paraquat	Stonefly *P. californica*	lab	no apparent effect	100.0	15.5	LC_{50}	96 hr.	687	
Paraquat-di (methyl) chloride	Harlequin fish *Rasbora heteromorpha*	lab	death	45	18-20	TL_m	24 hr.	546	
Paraquat-di (methyl) chloride	Harlequin fish *Rasbora heteromorpha*	lab	death	32	18-20	TL_m	48 hr.	546	
Parathion	Stonefly *P. badia*	lab	death	0.008	15.5	LC_{50}	24 hr.	687	
Parathion	Stonefly *P. badia*	lab	death	0.0056	15.5	LC_{50}	48 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Parathion	Stonefly P. badia	lab	death	0.0042	15.5	LC_{50}	96 hr.	687	
Parathion	Stonefly P. californica	lab	death	0.028	15.5	LC_{50}	24 hr.	687	
Parathion	Stonefly P. californica	lab	death	0.011	15.5	LC_{50}	48 hr.	687	
Parathion	Stonefly P. californica	lab	death	0.0054	15.5	LC_{50}	96 hr.	687	
Parathion	Stonefly C. sabulosa	lab	death	0.0088	15.5	LC_{50}	24 hr.	687	
Parathion	Stonefly C. sabulosa	lab	death	0.0035	15.5	LC_{50}	48 hr.	687	
Parathion	Stonefly C. sabulosa	lab	death	0.0015	15.5	LC_{50}	96 hr.	687	
Parathion	Stonefly P. californica	lab	death	0.028	15.5	LC_{50}	24 hr.	687	
Parathion	Stonefly P. californica	lab	death	0.011	15.5	LC_{50}	48 hr.	687	
Parathion	Stonefly P. californica	lab	death	0.0054	15.5	LC_{50}	96 hr.	687	
Parathion # 1	Bluegill Lepomis macrochirus	lab	death	0.83	25	TL_m	24 hr.	1187	soft water
Parathion # 1	Bluegill Lepomis macrochirus	lab	death	0.71	25	TL_m	48 hr.	1187	soft water
Parathion # 1	Bluegill Lepomis macrochirus	lab	death	2.8	25	TL_m	24 hr.	1187	hard water
Parathion # 1	Bluegill Lepomis macrochirus	lab	death	1.5	25	TL_m	48 hr.	1187	hard water
Parathion # 1	Fathead minnow Pimephales promelas	lab	death	1.6	25	TL_m	24 hr.	1187	soft water
Parathion # 1	Fathead minnow Pimephales promelas	lab	death	1.6	25	TL_m	48 hr.	1187	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus Conc. mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Parathion # 1	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.4	25	TL_m	96 hr.	1187	soft water
Parathion # 1	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.7	25	TL_m	24 hr.	1187	hard water
Parathion # 1	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.6	25	TL_m	48 hr.	1187	hard water
Parathion # 1	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.6	25	TL_m	96 hr.	1187	hard water
Parathion # 2	Fathead minnow <u>Pimephales promelas</u>	lab	death	4.8	25	TL_m	24 hr.	1187	soft water
Parathion # 2	Fathead minnow <u>Pimephales promelas</u>	lab	death	2.9	25	TL_m	48 hr.	1187	soft water
Parathion # 2	Fathead minnow <u>Pimephales promelas</u>	lab	death	2.8	25	TL_m	96 hr.	1187	soft water
Parathion # 2	Fathead minnow <u>Pimephales promelas</u>	lab	death	5.2	25	TL_m	24 hr.	1187	hard water
Parathion # 2	Fathead minnow <u>Pimephales promelas</u>	lab	death	3.7	25	TL_m	48 hr.	1187	hard water
Parathion # 2	Fathead minnow <u>Pimephales promelas</u>	lab	death	3.7	25	TL_m	96 hr.	1187	hard water
Penthion	Stonefly <u>P. californica</u>	lab	death	0.130	15.5	LC_{50}	24 hr.	687	
Penthion	Stonefly <u>P. californica</u>	lab	death	0.039	15.5	LC_{50}	48 hr.	687	
Penthion	Stonefly <u>P. californica</u>	lab	death	0.0045	15.5	LC_{50}	96 hr.	687	
Phenol	Bluegill <u>Lepomis macrochirus</u>	lab	death	25.85	25	TL_m	24 hr.	1252	
Phenol	Bluegill <u>Lepomis macrochirus</u>	lab	death	23.88	25	TL_m	48 hr.	1252	
Phenol	Bluegill <u>Lepomis macrochirus</u>	lab	death	23.88	25	TL_m	96 hr.	1252	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Conc. mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Phenol	Fathead minnow *Pimephales promelas*	lab	death	40.60	25	TL_m	24 hr.	1252	soft water
Phenol	Fathead minnow *Pimephales promelas*	lab	death	40.60	25	TL_m	48 hr.	1252	soft water
Phenol	Fathead minnow *Pimephales promelas*	lab	death	34.27	25	TL_m	96 hr.	1252	soft water
Phenol	Fathead minnow *Pimephales promelas*	lab	death	38.62	25	TL_m	24 hr.	1252	hard water
Phenol	Fathead minnow *Pimephales promelas*	lab	death	38.62	25	TL_m	48 hr.	1252	hard water
Phenol	Fathead minnow *Pimephales promelas*	lab	death	32.00	25	TL_m	96 hr.	1252	hard water
Phenol	Goldfish *Carassius auratus*	lab	death	49.86	25	TL_m	24 hr.	1252	
Phenol	Goldfish *Carassius auratus*	lab	death	49.13	25	TL_m	48 hr.	1252	
Phenol	Goldfish *Carassius auratus*	lab	death	44.49	25	TL_m	96 hr.	1252	
Phenol	Guppies *Lebistes reticulatus*	lab	death	49.86	25	TL_m	24 hr.	1252	
Phenol	Guppies *Lebistes reticulatus*	lab	death	49.86	25	TL_m	48 hr.	1252	
Phenol	Guppies *Lebistes reticulatus*	lab	death	39.19	25	TL_m	96 hr.	1252	
Phenol	Harlequin fish *Rasbora heteromorpha*	lab	death	8.2	18-20	TL_m	24 hr.	546	hard water
Phenol	Harlequin fish *Rasbora heteromorpha*	lab	death	6.8	18-20	TL_m	48 hr.	546	hard water
Phenol	Harlequin fish *Rasbora heteromorpha*	lab	death	11.0	18-20	TL_m	24 hr.	546	soft water
Phenol	Harlequin fish *Rasbora heteromorpha*	lab	death	7.4	18-20	TL_m	48 hr.	546	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus (C) mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Phenoxytol	Harlequin fish <u>Rasbora</u> <u>heteromorpha</u>	lab	death	165	18-20	TL_m	24 hr.	546	
Phenoxytol	Harlequin fish <u>Rasbora</u> <u>heteromorpha</u>	lab	death	135	18-20	TL_m	48 hr.	546	
Phenylmercuric acetate	Rainbow trout <u>Salmo</u> <u>gairdnerii</u>	lab	death	0.005	18-20	TL_m	24 hr.	546	
Phenylmercuric acetate	Rainbow trout <u>Salmo</u> <u>gairdnerii</u>	lab	death	0.004	18-20	TL_m	48 hr.	546	
Phosdrin	Stonefly <u>P.</u> <u>californica</u>	lab	death	0.056	15.5	LC_{50}	24 hr.	687	
Phosdrin	Stonefly <u>P.</u> <u>californica</u>	lab	death	0.009	15.5	LC_{50}	48 hr.	687	
Phosdrin	Stonefly <u>P.</u> <u>californica</u>	lab	death	0.005	15.5	LC_{50}	96 hr.	687	
Phosphamidon	Red crawfish <u>Procamburus</u> <u>clarki</u>	lab	death	20.0	16-32	TL_m	24 hr.	904	
Phosphamidon	Red crawfish <u>Procamburus</u> <u>clarki</u>	lab	death	6.0	16-32	TL_m	48 hr.	904	
Phosphamidon	Red crawfish <u>Procamburus</u> <u>clarki</u>	lab	death	5.5	16-32	TL_m	72 hr.	904	
<u>0</u>-Phthalic anhydride	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	not found	25	TL_m	24 hr.	1252	
<u>0</u>-Phthalic anhydride	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	not found	25	TL_m	48 hr.	1252	
<u>0</u>-Phthalic anhydride	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	not found	25	TL_m	96 hr.	1252	
<u>0</u>-Phthalic anhydride	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	not found	25	TL_m	24 hr.	1252	
<u>0</u>-Phthalic anhydride	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	not found	25	TL_m	48 hr.	1252	
<u>0</u>-Phthalic anhydride	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	not found	25	TL_m	96 hr.	1252	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. #	Remarks
0-Phthalic anhydride	Fathead minnow *Pimephales promelas*	lab	death	not found	25	TL_m	24 hr.	1252	
0-Phthalic anhydride	Fathead minnow *Pimephales promelas*	lab	death	not found	25	TL_m	48 hr.	1252	
0-Phthalic anhydride	Fathead minnow *Pimephales promelas*	lab	death	not found	25	TL_m	96 hr.	1252	
Picloram	Stonefly *P. californica*	lab	death	120	15.5	LC_{50}	24 hr.	687	
Picloram	Stonefly *P. californica*	lab	death	90	15.5	LC_{50}	48 hr.	687	
Picloram	Stonefly *P. californica*	lab	death	48	15.5	LC_{50}	96 hr.	687	
Polyborchlorate	Rainbow trout *Salmo gairdnerii*	lab	death	4200	18-20	TL_m	24 hr.	546	
Polyborchlorate	Rainbow trout *Salmo gairdnerii*	lab	death	2750	18-20	TL_m	48 hr.	546	
Potassium azide	Stonefly *P. californica*	lab	death	22	15.5	LC_{50}	24 hr.	687	
Potassium azide	Stonefly *P. californica*	lab	death	15	15.5	LC_{50}	48 hr.	687	
Potassium azide	Stonefly *P. californica*	lab	death	8.00	15.5	LC_{50}	96 hr.	687	
Potassium chromate	Fathead minnow *Pimephales promelas*	lab	death	109.	25	TL_m	24 hr.	1130	soft water
Potassium chromate	Fathead minnow *Pimephales promelas*	lab	death	60.4	25	TL_m	48 hr.	1130	soft water
Potassium chromate	Fathead minnow *Pimephales promelas*	lab	death	45.6	25	TL_m	96 hr.	1130	soft water
Potassium dichromate	Bluegill *Lepomis macrochirus*	lab	death	284.	25	TL_m	24 hr.	1130	soft water
Potassium dichromate	Bluegill *Lepomis macrochirus*	lab	death	171.	25	TL_m	48 hr.	1130	soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Potassium dichromate	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	118.	25	TL_m	96 hr.	1130	soft water
Potassium dichromate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	39.6	25	TL_m	24 hr.	1130	soft water
Potassium dichromate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	19.7	25	TL_m	48 hr.	1130	soft water
Potassium dichromate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	17.6	25	TL_m	96 hr.	1130	soft water
Potassium dichromate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	63.5	25	TL_m	24 hr.	1130	hard water
Potassium dichromate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	35.4	25	TL_m	48 hr.	1130	hard water
Potassium dichromate	Fathead minnow <u>Pimephales</u> <u>promelas</u>	lab	death	27.3	25	TL_m	96 hr.	1130	hard water
Potassium dichromate	Goldfish <u>Carassius</u> <u>auratus</u>	lab	death	122.	25	TL_m	24 hr.	1130	
Potassium dichromate	Goldfish <u>Carassius</u> <u>auratus</u>	lab	death	58.8	25	TL_m	48 hr.	1130	
Potassium dichromate	Goldfish <u>Carassius</u> <u>auratus</u>	lab	death	37.5	25	TL_m	96 hr.	1130	
Potassium dichromate	Guppies <u>Lebistes</u> <u>reticulatus</u>	lab	death	113.	25	TL_m	24 hr.	1130	
Potassium dichromate	Guppies <u>Lebistes</u> <u>reticulatus</u>	lab	death	61.7	25	TL_m	48 hr.	1130	
Potassium dichromate	Guppies <u>Lebistes</u> <u>reticulatus</u>	lab	death	30.0	25	TL_m	96 hr.	1130	
pp. DDT	Harlequin fish <u>Rasbora</u> <u>heteromorpha</u>	lab	death	0.013	18-20	TL_m	24 hr.	546	
pp. DDT	Harlequin fish <u>Rasbora</u> <u>heteromorpha</u>	lab	death	--	18-20	TL_m	48 hr.	546	
Pyramin	Harlequin fish <u>Rasbora</u> <u>heteromorpha</u>	lab	death	40	18-20	TL_m	24 hr.	546	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied C	Rate Function	Rate Effect	Ref. No.	Remarks
Pyramin	Harlequin fish Rasbora heteromorpha	lab	death	35	18-20	TL_m	48 hr.	546	
Pyrethrum	Stonefly P. californica	lab	death	0.010	15.5	LC_{50}	24 hr.	687	
Pyrethrum	Stonefly P. californica	lab	death	0.0064	15.5	LC_{50}	48 hr.	687	
Pyrethrum	Stonefly P. californica	lab	death	0.001	15.5	LC_{50}	96 hr.	687	
Reglone	Rainbow trout Salmo gairdnerii	lab	death	225	18-20	TL_m	24 hr.	546	hard water
Reglone	Rainbow trout Salmo gairdnerii	lab	death	175	18-20	TL_m	48 hr.	546	hard water
Reglone	Harlequin fish Rasbora heteromorpha	lab	death	190	18-20	TL_m	24 hr.	546	soft water
Reglone	Harlequin fish Rasbora heteromorpha	lab	death	73	18-20	TL_m	48 hr.	546	soft water
Reglone	Harlequin fish Rasbora heteromorpha	lab	death	180	18-20	TL_m	24 hr.	546	soft water
Reglone	Harlequin fish Rasbora heteromorpha	lab	death	93	18-20	TL_m	48 hr.	546	soft water
Rhodamine B	Bluegill Lepomis macrochirus	lab	death	754	12	LC_{50}	24 hr.	288	
Rhodamine B	Bluegill Lepomis macrochirus	lab	death	700	12	LC_{50}	48 hr.	288	
Rhodamine B	Bluegill Lepomis macrochirus	lab	death	379	12	LC_{50}	96 hr.	288	
Rhodamine B	Channel catfish Ictalurus punctatus	lab	death	962	12	LC_{50}	24 hr.	288	
Rhodamine B	Channel catfish Ictalurus punctatus	lab	death	647	12	LC_{50}	48 hr.	288	
Rhodamine B	Channel catfish Ictalurus punctatus	lab	death	526	12	LC_{50}	96 hr.	288	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No	Remarks
Rhodamine B	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	736	12	LC_{50}	24 hr.	288	
Rhodamine B	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	306	12	LC_{50}	48 hr.	288	
Rhodamine B	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	217	12	LC_{50}	96 hr.	288	
Rotenone	Stonefly <u>P. californica</u>	lab	death	2.900	15.5	LC_{50}	24 hr.	687	
Rotenone	Stonefly <u>P. californica</u>	lab	death	1.100	15.5	LC_{50}	48 hr.	687	
Rotenone	Stonefly <u>P. californica</u>	lab	death	0.380	15.5	LC_{50}	96 hr.	687	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	0	22.5	LT_{50} > 107	TL_m 60 hr. (salinity)	582	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	5.2	22.6	> 107	TL_m 60 hr. (salinity)	582	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	10.0	22.7	> 107	TL_m 60 hr. (salinity)	582	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	15.4	22.7	52	TL_m 60 hr. (salinity)	582	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	19.6	19.5	6	TL_m 60 hr. (salinity)	582	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	0	20.5	> 60	TL_m 60 hr. (salinity)	582	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	5.2	20.8	> 60	TL_m 60 hr (salinity)	582	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	10.5	20.8	> 60	TL_m 60 hr. (salinity)	582	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	15.4	20.8	58	TL_m 60 hr. (salinity)	582	
Salinity	White catfish <u>Ictalurus catus</u>	lab	death	20.8	21	16	TL_m 60 hr. (salinity)	582	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Selenium	Goldfish *Carassius auratus*	lab	death	12.0	19-25	LC_{50}	7 days	1017	
Selenium	Goldfish *Carassius auratus*	lab	death	1.0	19-25	LC_1	7 days	1017	
Sevin	Red crawfish *Procamburus clarki*	lab	death	5.0	16-32	TL_m	24 hr.	904	
Sevin	Red crawfish *Procamburus clarki*	lab	death	3.0	16-32	TL_m	48 hr.	904	
Sevin	Red crawfish *Procamburus clarki*	lab	death	2.0	16-32	TL_m	72 hr.	904	
Shell D50	Rainbow trout *Salmo gairdnerii*	lab	death	250	18-20	TL_m	24hr.	546	
Shell D50	Rainbow trout *Salmo gairdnerii*	lab	death	210	18-20	TL_m	48hr.	546	
Shell 2, 4-D QR pellets	Harlequin fish *Rasbora heteromorpha*	lab	death	7000	18-20	TL_m	24 hr.	546	hard water
Shell 2, 4-D QR pellets	Harlequin fish *Rasbora heteromorpha*	lab	death	--	18-20	TL_m	48 hr.	546	hard water
Shell 2, 4-D QR pellets	Rainbow trout *Salmo gairdnerii*	lab	death	7000	18-20	TL_m	24 hr.	546	hard water
Shell 2, 4-D QR pellets	Rainbow trout *Salmo gairdnerii*	lab	death	4800	18-20	TL_m	48 hr.	546	hard water
Shell 2, 4-D SR pellets	Harlequin fish *Rasbora heteromorpha*	lab	death	3950	18-20	TL_m	24 hr.	546	hard water
Shell 2, 4-D SR pellets	Harlequin fish *Rasbora heteromorpha*	lab	death	3100	18-20	TL_m	48 hr.	546	hard water
Shell 2, 4-D SR pellets	Rainbow trout *Salmo gairdnerii*	lab	death	3400	18-20	TL_m	24 hr.	546	hard water
Shell 2, 4-D SR pellets	Rainbow trout *Salmo gairdnerii*	lab	death	2400	18-20	TL_m	48 hr.	546	hard water
Silvex	Stonefly *P. californica*	lab	death	5.20	15.5	LC_{50}	24 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Silvex	Stonefly <u>P. californica</u>	lab	death	0.76	15.5	LC_{50}	48 hr.	687	
Silvex	Stonefly <u>P. californica</u>	lab	death	0.34	15.5	LC_{50}	96 hr.	687	
Simazin sand	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	2200	18-20	TL_m	24 hr.	546	
Simazin sand	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	--	18-20	TL_m	48 hr.	546	
Simazin wettable powder	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	95	18-20	TL_m	24 hr.	546	
Simazin wettable powder	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	85	18-20	TL_m	48 hr.	546	
Slix (detergent)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	8.9	18-20	TL_m	24 hr.	546	
Slix (detergent)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	8.3	18-20	TL_m	48 hr.	546	
S. N. 5215	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	33	18-20	TL_m	24 hr.	546	
S. N. 5215	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	23	18-20	TL_m	48 hr.	546	
Sodium arsenite	Stonefly <u>P. californica</u>	lab	death	140	18-20	TL_m	24 hr.	687	
Sodium arsenite	Stonefly <u>P. californica</u>	lab	death	120	18-20	TL_m	48 hr.	687	
Sodium arsenite	Stonefly <u>P. californica</u>	lab	death	38	18-20	TL_m	96 hr.	687	
Sodium azide	Stonefly <u>P. californica</u>	lab	death	16	18-20	TL_m	24 hr.	687	
Sodium azide	Stonefly <u>P. californica</u>	lab	death	12	18-20	TL_m	48 hr.	687	
Sodium azide	Stonefly <u>P. californica</u>	lab	death	9.20	18-20	TL_m	96 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Conc. mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Sodium chlorate	Harlequin fish *Rasbora heteromorpha*	lab	death	8600	18-20	TL_m	24 hr.	546	
Sodium chlorate	Harlequin fish *Rasbora heteromorpha*	lab	death	--	18-20	TL_m	48 hr.	546	
Sodium nitrate	Harlequin fish *Rasbora heteromorpha*	lab	death	380	18-20	TL_m	24 hr.	546	
Sodium nitrate	Harlequin fish *Rasbora heteromorpha*	lab	death	210	18-20	TL_m	48 hr.	546	
Sodium pentachlorophenate	Rainbow trout *Salmo gairdnerii*	lab	death	0.29	18-20	TL_m	24 hr.	546	
Sodium pentachlorophenate	Rainbow trout *Salmo gairdnerii*	lab	death	0.17	18-20	TL_m	48 hr.	546	
Stock synthetic detergent w/30.3% ABS detergent	Eels *Anguilla rostata*	lab	death	8.2	25	LC_{50}	24 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Eels *Anguilla rostata*	lab	death	8.2	25	LC_{50}	48 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Eels *Anguilla rostata*	lab	death	7.5	25	LC_{50}	96 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Mullet *Mugil cephalus*	lab	death	12.0	25	LC_{50}	24 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Mullet *Mugil cephalus*	lab	death	10.1	25	LC_{50}	48 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Mullet *Mugil cephalus*	lab	death	10.1	25	LC_{50}	96 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Mummichog *Fundulus heteroclitus*	lab	death	23.5	25	LC_{50}	24 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Mummichog *Fundulus heteroclitus*	lab	death	23.5	25	LC_{50}	48 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Mummichog *Fundulus heteroclitus*	lab	death	22.5	25	LC_{50}	96 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Silversides *Menidia menidia*	lab	death	7.2	25	LC_{50}	24 hr.	327	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Stock synthetic detergent w/30.3% ABS detergent	Silversides <u>Menidia menidia</u>	lab	death	7.2	25	LC_{50}	48 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Silversides <u>Menidia menidia</u>	lab	death	7.0	25	LC_{50}	96 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Winter flounder <u>Pseudopleuronectes americanus</u>	lab	death	12.0	25	LC_{50}	24 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Winter flounder <u>Pseudopleuronectes americanus</u>	lab	death	10.0	25	LC_{50}	48 hr.	327	
Stock synthetic detergent w/30.3% ABS detergent	Winter flounder <u>Pseudopleuronectes americanus</u>	lab	death	8.2	25	LC_{50}	96 hr.	327	
Strobane	Stonefly <u>P. californica</u>	lab	death	0.040	15.5	LC_{50}	24 hr.	687	
Strobane	Stonefly <u>P. californica</u>	lab	death	0.007	15.5	LC_{50}	48 hr.	687	
Strobane	Stonefly <u>P. californica</u>	lab	death	0.0005	15.5	LC_{50}	96 hr.	687	
Styrene	Bluegill <u>Lepomis macrochirus</u>	lab	death	25.05	25	TL_m	24 hr.	1252	soft water
Styrene	Bluegill <u>Lepomis macrochirus</u>	lab	death	25.05	25	TL_m	48 hr.	1252	soft water
Styrene	Bluegill <u>Lepomis macrochirus</u>	lab	death	25.05	25	TL_m	96 hr.	1252	soft water
Styrene	Fathead minnow <u>Pimephales promelas</u>	lab	death	56.73	25	TL_m	24 hr.	1252	soft water
Styrene	Fathead minnow <u>Pimephales promelas</u>	lab	death	53.58	25	TL_m	48 hr.	1252	soft water
Styrene	Fathead minnow <u>Pimephales promelas</u>	lab	death	46.41	25	TL_m	96 hr.	1252	soft water
Styrene	Fathead minnow <u>Pimephales promelas</u>	lab	death	62.81	25	TL_m	24 hr.	1252	hard water
Styrene	Fathead minnow <u>Pimephales promelas</u>	lab	death	62.81	25	TL_m	48 hr.	1252	hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Styrene	Fathead minnow *Pimephales promelas*	lab	death	59.30	25	TL_m	96 hr.	1252	hard water
Styrene	Goldfish *Carassius auratus*	lab	death	64.74	25	TL_m	24 hr.	1252	soft water
Styrene	Goldfish *Carassius auratus*	lab	death	64.74	25	TL_m	48 hr.	1252	soft water
Styrene	Goldfish *Carassius auratus*	lab	death	64.74	25	TL_m	96 hr.	1252	soft water
Styrene	Guppies *Lebistes reticulatus*	lab	death	74.83	25	TL_m	24 hr.	1252	soft water
Styrene	Guppies *Lebistes reticulatus*	lab	death	74.83	25	TL_m	48 hr.	1252	soft water
Styrene	Guppies *Lebistes reticulatus*	lab	death	74.83	25	TL_m	96 hr.	1252	soft water
Systox	Fathead minnow *Pimephales promelas*	lab	death	4.4	25	TL_m	24 hr.	1187	soft water
Systox	Fathead minnow *Pimephales promelas*	lab	death	4.1	25	TL_m	48 hr.	1187	soft water
Systox	Fathead minnow *Pimephales promelas*	lab	death	3.9	25	TL_m	96 hr.	1187	soft water
Systox	Fathead minnow *Pimephales promelas*	lab	death	4.6	25	TL_m	24 hr.	1187	hard water
Systox	Fathead minnow *Pimephales promelas*	lab	death	4.6	25	TL_m	48 hr.	1187	hard water
Systox	Fathead minnow *Pimephales promelas*	lab	death	4.6	25	TL_m	96 hr.	1187	hard water
TDE (DDD)	Stonefly *P. californica*	lab	death	3.00	15.5	LC_{50}	24 hr.	687	
TDE (DDD)	Stonefly *P. californica*	lab	death	1.10	15.5	LC_{50}	48 hr.	687	
TDE (DDD)	Stonefly *P. californica*	lab	death	0.380	15.5	LC_{50}	96 hr.	687	
Temperature	Algae *Chondrus chrispus*	lab	reproduction		refer to remarks	Q_{10} 0-10	2.20	589	temperature in July at the surface of rocks 24.5°C

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Temperature	Algae Chondrus chrispus	lab	reproduction		refer to remarks	Q_{10} 10-20	1.23	589	
Temperature	Algae Chondrus chrispus	lab	reproduction		refer to remarks	Q_{10} 20-30	1.09	589	
Temperature	Algae Chondrus chrispus	lab	reproduction		refer to remarks	Q_{10} 0-10	3.00	589	temperature in Sept. at the surface of rocks 17°C
Temperature	Algae Chondrus chrispus	lab	reproduction		refer to remarks	Q_{10} 10-20	1.50	589	
Temperature	Algae Chondrus chrispus	lab	reproduction		refer to remarks	Q_{10} 20-30	1.20	589	
Temperature	Algae Chondrus chrispus	lab	reproduction		refer to remarks	Q_{10} 0-10	1.67	589	temperature in Dec. at the surface of rocks 10.5°C
Temperature	Algae Chondrus chrispus	lab	reproduction		refer to remarks	Q_{10} 10-20	2.60	589	
Temperature	Algae Enteromorpha intesinalis	lab	reproduction		refer to remarks	Q_{10} 0-10	3.00	589	temperature in July at the surface of the Ulva 16°C
Temperature	Algae Enteromorpha intesinalis	lab	reproduction		refer to remarks	Q_{10} 10-20	1.09	589	
Temperature	Algae Enteromorpha intesinalis	lab	reproduction		refer to remarks	Q_{10} 20-30	1.10	589	
Temperature	Algae Enteromorpha intesinalis	lab	reproduction		refer to remarks	Q_{10} 0-10	2.00	589	temperature in Sept. at the surface of the Ulva 12.5°C
Temperature	Algae Enteromorpha intesinalis	lab	reproduction		refer to remarks	Q_{10} 10-20	1.39	589	
Temperature	Algae Enteromorpha intesinalis	lab	reproduction		refer to remarks	Q_{10} 20-30	1.35	589	
Temperature	Algae Enteromorpha intesinalis	lab	reproduction		refer to remarks	Q_{10} 0-10	1.20	589	temperature in Dec. at the surface of the Ulva 10.0°C
Temperature	Algae Enteromorpha intesinalis	lab	reproduction		refer to remarks	Q_{10} 10-20	2.83	589	
Temperature	Algae Fucus (?ceranoides)	lab	reproduction		refer to remarks	Q_{10} 0-10	3.00	589	temperature in July sea temperature 21.5°C

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Temperature	Algae <u>Fucus</u> <u>(?ceranoides)</u>	lab	reproduction		refer to remarks	Q_{10} 10-20	1.17	589	
Temperature	Algae <u>Fucus</u> <u>(?ceranoides)</u>	lab	reproduction		refer to remarks	Q_{10} 20-30	1.08	589	
Temperature	Algae <u>Fucus</u> <u>(?ceranoides)</u>	lab	reproduction		refer to remarks	Q_{10} 0-10	3.00	589	temperature in Sept. sea temperature 21.5°C
Temperature	Algae <u>Fucus</u> <u>(?ceranoides)</u>	lab	reproduction		refer to remarks	Q_{10} 10-20	1.30	589	
Temperature	Algae <u>Fucus</u> <u>(?ceranoides)</u>	lab	reproduction		refer to remarks	Q_{10} 20-30	1.58	589	
Temperature	Algae <u>Fucus</u> <u>(?ceranoides)</u>	lab	reproduction		refer to remarks	Q_{10} 0-10	1.40	589	temperature in Dec. sea temperature 10°C
Temperature	Algae <u>Fucus</u> <u>(?ceranoides)</u>	lab	reproduction		refer to remarks	Q_{10} 10-20	2.75	589	
Temperature	Algae <u>Griffithesia</u> <u>flosculosa</u>	lab	reproduction		refer to remarks	Q_{10} 0-10	2.75	589	
Temperature	Algae <u>Griffithesia</u> <u>flosculosa</u>	lab	reproduction		refer to remarks	Q_{10} 10-20	1.22	589	
Temperature	Algae <u>Griffithesia</u> <u>flosculosa</u>	lab	reproduction		refer to remarks	Q_{10} 20-30	1.21	589	
Temperature	Algae <u>Griffithesia</u> <u>flosculosa</u>	lab	reproduction		refer to remarks	Q_{10} 0-10	1.75	589	
Temperature	Algae <u>Griffithesia</u> <u>flosculosa</u>	lab	reproduction		refer to remarks	Q_{10} 10-20	1.78	589	
Temperature	Algae <u>Griffithesia</u> <u>flosculosa</u>	lab	reproduction		refer to remarks	Q_{10} 20-30	1.81	589	
Temperature	Algae <u>Griffithesia</u> <u>flosculosa</u>	lab	reproduction		refer to remarks	Q_{10} 0-10	1.75	589	
Temperature	Algae <u>Griffithesia</u> <u>flosculosa</u>	lab	reproduction		refer to remarks	Q_{10} 10-20	2.63	589	
Temperature	Algae <u>Porphyra</u> <u>umbilicutis</u>	lab	reproduction		refer to remarks	Q_{10} 0-10	3.30	589	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Temperature	Algae Porphyra umbilicutis	lab	reproduction		refer to remarks	10-20 Q_{10}	1.06	589	
Temperature	Algae Porphyra umbilicutis	lab	reproduction		refer to remarks	20-30 Q_{10}	1.11	589	
Temperature	Algae Porphyra umbilicutis	lab	reproduction		refer to remarks	0-10 Q_{10}	2.00	589	
Temperature	Algae Porphyra umbilicutis	lab	reproduction		refer to remarks	10-20 Q_{10}	1.28	589	
Temperature	Algae Ulva luctuca	lab	reproduction		refer to remarks	0-10 Q_{10}	1.40	589	
Temperature	Algae Ulva luctuca	lab	reproduction		refer to remarks	10-20 Q_{10}	1.12	589	
Temperature	Algae Ulva luctuca	lab	reproduction		refer to remarks	20-30 Q_{10}	1.60	589	
Temperature	Algae Ulva luctuca	lab	reproduction		refer to remarks	0-10 Q_{10}	1.63	589	
Temperature	Algae Ulva luctuca	lab	reproduction		refer to remarks	10-20 Q_{10}	1.33	589	
Temperature	Algae Ulva luctuca	lab	reproduction		refer to remarks	20-30 Q_{10}	1.65	589	
Temperature	Algae Ulva luctuca	lab	reproduction		refer to remarks	0-10 Q_{10}	2.00	589	
Temperature	Algae Ulva luctuca	lab	reproduction		refer to remarks	10-20 Q_{10}	1.92	589	
Temperature and Weight	Ampullariid snail Maris cornuarietis L.	lab	reproduction	10 mg	20-25	Q_{10}	9.00	924	
Temperature and Weight	Ampullariid snail Maris cornuarietis L.	lab	reproduction	10 mg	25-30	Q_{10}	2.96	924	
Temperature and Weight	Ampullariid snail Maris cornuarietis L.	lab	reproduction	10 mg	30-35	Q_{10}	1.58	924	
Temperature and Weight	Ampullariid snail Maris cornuarietis L.	lab	reproduction	350 mg	20-25	Q_{10}	3.65	924	

Stimulus	Organism	Experimental Habitat	Response	Stimulus %/mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Temperature and Weight	Ampullariid snail *Maris cornuarietis* L.	lab	reproduction	350 mg	25-30	Q_{10}	1.34	924	
Temperature and Weight	Ampullariid snail *Maris cornuarietis* L.	lab	reproduction	350 mg	30-35	Q_{10}	1.02	924	
Temperature and Weight	Ampullariid snail *Maris cornuarietis* L.	lab	reproduction	800 mg	20-25	Q_{10}	2.95	924	
Temperature and Weight	Ampullariid snail *Maris cornuarietis* L.	lab	reproduction	800 mg	25-30	Q_{10}	1.11	924	
Temperature and Weight	Ampullariid snail *Maris cornuarietis* L.	lab	reproduction	800 mg	30-35	Q_{10}	0.93	924	
Temperature	Daphnia *Daphnia galeata*	lab	reproduction		15-25	Q_{10}	2.80	847	
Temperature	Daphnia *Daphnia magna*	lab	reproduction		15-25	Q_{10}	2.38	847	
Temperature	Daphnia *Daphnia pulex*	lab	reproduction		15-25	Q_{10}	0.95	847	
Temperature	Daphnia *Daphnia schodleri*	lab	reproduction		15-25	Q_{10}	0.80	847	
Temperature	White catfish *Ictalurus catus*	lab			22.3	TL_{50}	TL_{50} hr. >48	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			25.9	TL_{50}	>48	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			30.0	TL_{50}	8	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			36.5	TL_{50}	0.4	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			40.0	TL_{50}	< 0.1	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			43.0	TL_{50}	< 0.1	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			21.4	TL_{50}	>96	582	Small fish 194

Stimulus	Organism	Experimental Habitat	Response	Stimulus Conc mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Temperature	White catfish *Ictalurus catus*	lab			25.6	TL_{50}	32	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			30.1	TL_{50}	96	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			34.8	TL_{50}	5	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			39.7	TL_{50}	< 0.1	582	Small fish 194
Temperature	White catfish *Ictalurus catus*	lab			21.7	TL_{50}	>22	582	Large fish 256
Temperature	White catfish *Ictalurus catus*	lab			25.3	TL_{50}	20	582	Large fish 256
Temperature	White catfish *Ictalurus catus*	lab			29.9	TL_{50}	6	582	Large fish 256
Temperature	White catfish *Ictalurus catus*	lab			34.2	TL_{50}	1	582	Large fish 256
Temperature	White catfish *Ictalurus catus*	lab			40.0	TL_{50}	< 0.2	582	Large fish 256
Temperature	White catfish *Ictalurus catus*	lab			19.9	TL_{50}	>34	582	Large fish 256
Temperature	White catfish *Ictalurus catus*	lab			25.3	TL_{50}	34	582	Large fish 256
Temperature	White catfish *Ictalurus catus*	lab			30.3	TL_{50}	9	582	Large fish 256
Temperature	White catfish *Ictalurus catus*	lab			35.3	TL_{50}	1	582	Large fish 256
Temperature	White catfish *Ictalurus catus*	lab			38.5	TL_{50}	< 0.1	582	Large fish 256
Temperature	Young-of-the-year Cisco *Coregonus artedii*	lab	death	temperature 19.75°C	acclimation temp. 2	lethal temp.	upper lethal temp.	960	
Temperature	Young-of-the-year Cisco *Coregonus artedii*	lab	death	temperature 21.75°C	acclimation temp. 5	lethal temp.	upper lethal temp.	960	

Stimulus	Organism	Experimental Habitat	Response	Stimulus Conc. mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Temperature	Young-of-the-year Cisco <u>Coregonus</u> <u>artedii</u>	lab	death	temperature 24.25°C	acclimation temp. 10	lethal temp.	upper lethal temp.	960	
Temperature	Young-of-the-year Cisco <u>Coregonus</u> <u>artedii</u>	lab	death	26.25°C	20	lethal temp.	upper lethal temp.	960	
Temperature	Young-of-the-year Cisco <u>Coregonus</u> <u>artedii</u>	lab	death	25.75°C	25	lethal temp.	upper lethal temp.	960	
Temperature	Young-of-the-year Cisco <u>Coregonus</u> <u>artedii</u>	lab	death	< 0.3 °C	2	lethal temp.	lower lethal temp.	960	
Temperature	Young-of-the-year Cisco <u>Coregonus</u> <u>artedii</u>	lab	death	< 0.5 °C	5	lethal temp.	lower lethal temp.	960	
Temperature	Young-of-the-year Cisco <u>Coregonus</u> <u>artedii</u>	lab	death	3.0 °C	10	lethal temp.	lower lethal temp.	960	
Temperature	Young-of-the-year Cisco <u>Coregonus</u> <u>artedii</u>	lab	death	4.75°C	20	lethal temp.	lower lethal temp.	960	
Temperature	Young-of-the-year Cisco <u>Coregonus</u> <u>artedii</u>	lab	death	9.75°C	25	lethal temp.	lower lethal temp.	960	
TEPP	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	0.84	25	TL_m	24 hr.	1187	Soft water
TEPP	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	0.84	25	TL_m	48 hr.	1187	Soft water
TEPP	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	0.84	25	TL_m	96 hr.	1187	Soft water
TEPP	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	0.79	25	TL_m	24 hr.	1187	Hard water
TEPP	Bluegill <u>Lepomis</u> <u>macrochirus</u>	lab	death	0.79	25	TL_m	48 hr.	1187	Hard water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
TEPP	Bluegill <u>Lepomis macrochirus</u>	lab	death	0.79	25	TL_m	96 hr.	1187	Hard water
TEPP	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.7	25	TL_m	24 hr.	1187	Soft water
TEPP	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.7	25	TL_m	48 hr.	1187	Soft water
TEPP	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.7	25	TL_m	96 hr.	1187	Soft water
TEPP	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.0	25	TL_m	24 hr.	1187	Hard water
TEPP	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.0	25	TL_m	48 hr.	1187	Hard water
TEPP	Fathead minnow <u>Pimephales promelas</u>	lab	death	1.0	25	TL_m	96 hr.	1187	Hard water
Tetrahydrofurfuryl Alcohol	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	3800	18 - 20	TL_m	24 hr.	546	
Tetrahydrofurfuryl Alcohol	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	3400	18 - 20	TL_m	48 hr.	546	
Thiumet	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	32	18 - 20	TL_m	24 hr.	546	
Thiumet	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	17	18 - 20	TL_m	48 hr.	546	
Toluene Reagent	Bluegill <u>Lepomis macrochirus</u>	lab	death	24.00	25	TL_m	24 hr.	1252	
Toluene Reagent	Bluegill <u>Lepomis macrochirus</u>	lab	death	24.00	25	TL_m	48 hr.	1252	
Toluene Reagent	Bluegill <u>Lepomis macrochirus</u>	lab	death	24.00	25	TL_m	96 hr.	1252	
Toluene Reagent	Fathead minnow <u>Pimephales promelas</u>	lab	death	46.31	25	TL_m	24 hr.	1252	Soft water
Toluene Reagent	Fathead minnow <u>Pimephales promelas</u>	lab	death	46.31	25	TL_m	48 hr.	1252	Soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Toluene Reagent	Fathead minnow *Pimephales promelas*	lab	death	34.27	25	TL_m	96 hr.	1252	Soft water
Toluene Reagent	Fathead minnow *Pimephales promelas*	lab	death	56.00	25	TL_m	24 hr.	1252	Hard water
Toluene Reagent	Fathead minnow *Pimephales promelas*	lab	death	56.00	25	TL_m	48 hr.	1252	Hard water
Toluene Reagent	Fathead minnow *Pimephales promelas*	lab	death	42.33	25	TL_m	96 hr.	1252	Hard water
Toluene Reagent	Goldfish *Carassius auratus*	lab	death	57.68	25	TL_m	24 hr.	1252	
Toluene Reagent	Goldfish *Carassius auratus*	lab	death	57.68	25	TL_m	48 hr.	1252	
Toluene Reagent	Goldfish *Carassius auratus*	lab	death	57.68	25	TL_m	96 hr.	1252	
Toluene Reagent	Guppy *Lebistes reticulatus*	lab	death	62.81	25	TL_m	24 hr.	1252	
Toluene Reagent	Guppy *Lebistes reticulatus*	lab	death	60.95	25	TL_m	48 hr.	1252	
Toluene Reagent	Guppy *Lebistes reticulatus*	lab	death	59.30	25	TL_m	96 hr.	1252	
Tordon C	Harlequin fish *Rasbora heteromorpha*	lab	death	252	18 - 20	TL_m	24 hr.	546	
Tordon C	Harlequin fish *Rasbora heteromorpha*	lab	death	248	18 - 20	TL_m	48 hr.	546	
Tordon 22 K	Harlequin fish *Rasbora heteromorpha*	lab	death	66	18 - 20	TL_m	24 hr.	546	
Tordon 22 K	Harlequin fish *Rasbora heteromorpha*	lab	death	44	18 - 20	TL_m	48 hr.	546	
Tordon M	Harlequin fish *Rasbora heteromorpha*	lab	death	210	18 - 20	TL_m	24 hr.	546	
Tordon M	Harlequin fish *Rasbora heteromorpha*	lab	death	185	18 - 20	TL_m	48 hr.	546	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Toxaphene	Goldfish <u>Carassius auratus</u>	lab	death	Fiducial limits of LC_{50} in ppm 0.006-0.010	$68^{o}F$	LC_{50}		871	Type of toxaphene Sinking
Toxaphene	Goldfish <u>Carassius auratus</u>	lab	death	0.000-0.024	$68^{o}F$	LC_{50}		871	Floating
Toxaphene	Goldfish <u>Carassius auratus</u>	lab	death	0.013-.020	$68^{o}F$	LC_{50}		871	Sinking
Toxaphene	Goldfish <u>Carassius auratus</u>	lab	death	.026-.030	$68^{o}F$	LC_{50}		871	Floating
Toxaphene	Goldfish <u>Carassius auratus</u>	lab	death	.005-.016	$68^{o}F$	LC_{50}		871	Sinking
Toxaphene	Goldfish <u>Carassius auratus</u>	lab	death	.005-.010	$68^{o}F$	LC_{50}		871	Floating
Toxaphene	Goldfish <u>Carassius auratus</u>	lab	death	.029-.066	$47^{o}F$	LC_{50}		871	Sinking
Toxaphene	Goldfish <u>Carassius auratus</u>	lab	death	.016-.040	$47^{o}F$	LC_{50}		871	Floating
Toxaphene	Mosquito fish <u>Gambusia affinis</u>	lab	death	.047-.049	$68^{o}F$	LC_{50}		871	Sinking
Toxaphene	Mosquito fish <u>Gambusia affinis</u>	lab	death	.023-.025	$68^{o}F$	LC_{50}		871	Floating
Toxaphene	Mosquito fish <u>Gambusia affinis</u>	lab	death	.005-.007	$68^{o}F$	LC_{50}		871	Sinking
Toxaphene	Mosquito fish <u>Gambusia affinis</u>	lab	death	.047-.059	$68^{o}F$	LC_{50}		871	Floating
Toxaphene	Mosquito fish <u>Gambusia affinis</u>	lab	death	.006-010	$68^{o}F$	LC_{50}		871	Sinking
Toxaphene	Mosquito fish <u>Gambusia affinis</u>	lab	death	.008-010	$68^{o}F$	LC_{50}		871	Floating
Toxaphene	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	.013-040	$55^{o}F$	LC_{50}		871	Sinking
Toxaphene	Rainbow trout <u>Salmo gairdnerii</u>	lab	death	.015-.054	$55^{o}F$	LC_{50}		871	Floating

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Toxaphene	Stonefly *P. californica*	lab	death	0.018	15.5	LC_{50}	24 hr.	687	
Toxaphene	Stonefly *P. californica*	lab	death	0.007	15.5	LC_{50}	48 hr.	687	
Toxaphene	Stonefly *P. californica*	lab	death	0.0023	15.5	LC_{50}	96 hr.	687	
Toxaphene	Stonefly *P. badia*	lab	death	0.0092	15.5	LC_{50}	24 hr.	687	
Toxaphene	Stonefly *P. badia*	lab	death	0.0056	15.5	LC_{50}	48 hr.	687	
Toxaphene	Stonefly *P. badia*	lab	death	0.003	15.5	LC_{50}	96 hr.	687	
Toxaphene	Stonefly *P. californica*	lab	death	0.018	15.5	LC_{50}	24 hr.	687	
Toxaphene	Stonefly *P. californica*	lab	death	0.007	15.5	LC_{50}	48 hr.	687	
Toxaphene	Stonefly *P. californica*	lab	death	0.0023	15.5	LC_{50}	96 hr.	687	
Toxaphene	Stonefly *C. sabulosa*	lab	death	0.006	15.5	LC_{50}	24 hr.	687	
Toxaphene	Stonefly *C. sabulosa*	lab	death	0.0032	15.5	LC_{50}	48 hr.	687	
Toxaphene	Stonefly *C. sabulosa*	lab	death	0.0013	15.5	LC_{50}	96 hr.	687	
Tributyl Tin oxide	Rainbow trout *Salmo gairdnerii*	lab	death	0.028	18 - 20	TL_m	24 hr.	546	
Tributyl Tin oxide	Rainbow trout *Salmo gairdnerii*	lab	death	0.021	18 - 20	TL_m	48 hr.	546	
Trichlorofon	Stonefly *P. badia*	lab	death	0.050	15.5	LC_{50}	24 hr.	687	
Trichlorofon	Stonefly *P. badia*	lab	death	0.022	15.5	LC_{50}	48 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Trichlorofon	Stonefly <u>P. badia</u>	lab	death	0.011	15.5	LC_{50}	96 hr.	687	
Trichlorofon	Stonefly <u>P. californica</u>	lab	death	0.320	15.5	LC_{50}	24 hr.	687	
Trichlorofon	Stonefly <u>P. californica</u>	lab	death	0.180	15.5	LC_{50}	48 hr.	687	
Trichlorofon	Stonefly <u>P. californica</u>	lab	death	0.035	15.5	LC_{50}	96 hr.	687	
Trichlorofon	Stonefly <u>C. sabulosa</u>	lab	death	0.110	15.5	LC_{50}	24 hr.	687	
Trichlorofon	Stonefly <u>C. sabulosa</u>	lab	death	0.070	15.5	LC_{50}	48 hr.	687	
Trichlorofon	Stonefly <u>C. sabulosa</u>	lab	death	0.022	15.5	LC_{50}	96 hr.	687	
Trichlorofon	Stonefly <u>P. californica</u>	lab	death	0.320	15.5	LC_{50}	24 hr.	687	
Trichlorofon	Stonefly <u>P. californica</u>	lab	death	0.180	15.5	LC_{50}	48 hr.	687	
Trichlorofon	Stonefly <u>P. californica</u>	lab	death	0.035	15.5	LC_{50}	96 hr.	687	
Trifluralin	Stonefly <u>P. californica</u>	lab	death	13	15.5	LC_{50}	24 hr.	687	
Trifluralin	Stonefly <u>P. californica</u>	lab	death	4.20	15.5	LC_{50}	48 hr.	687	
Trifluralin	Stonefly <u>P. californica</u>	lab	death	3.00	15.5	LC_{50}	96 hr.	687	
2, 4-D (sodium salt)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	1160	18 - 20	TL_m	24 hr.	546	
2, 4-D (sodium salt)	Harlequin fish <u>Rasbora heteromorpha</u>	lab	death	--	18 - 20	TL_m	48 hr.	546	
2, 4-D	Stonefly <u>P. californica</u>	lab	death	56	15.5	LC_{50}	24 hr.	687	

Stimulus	Organism	Experimental Habitat	Response	Stimulus (C) mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
2, 4-D	Stonefly *P. californica*	lab	death	44	15.5	LC_{50}	48 hr.	687	
2, 4-D	Stonefly *P. californica*	lab	death	15	15.5	LC_{50}	96 hr.	687	
2, 4-D butoxy ethanol ester	Stonefly *P. californica*	lab	death	8.50	15.5	LC_{50}	24 hr.	687	
2, 4-D butoxy ethanol ester	Stonefly *P. californica*	lab	death	1.80	15.5	LC_{50}	48 hr.	687	
2, 4-D butoxy ethanol ester	Stonefly *P. californica*	lab	death	1.60	15.5	LC_{50}	96 hr.	687	
Ureabor	Rainbow trout *Salmo gairdnerii*	lab	death	975	18 - 20	TL_m	24 hr.	546	
Ureabor	Rainbow trout *Salmo gairdnerii*	lab	death	925	18 - 20	TL_m	48 hr.	546	
Venzar	Harlequin fish *Rasbora heteromorpha*	lab	death	≈50	18 - 20	TL_m	24 hr.	546	
Venzar	Harlequin fish *Rasbora heteromorpha*	lab	death	≈50	18 - 20	TL_m	48 hr.	546	
Vinyl acetate	Bluegill *Lepomis macrochirus*	lab	death	18.53	25	TL_m	24 hr.	1252	Soft water
Vinyl acetate	Bluegill *Lepomis macrochirus*	lab	death	18.00	25	TL_m	48 hr.	1252	Soft water
Vinyl acetate	Bluegill *Lepomis macrochirus*	lab	death	18.00	25	TL_m	96 hr.	1252	Soft water
Vinyl acetate	Fathead minnow *Pimephales promelas*	lab	death	24.00	25	TL_m	24 hr.	1252	Soft water
Vinyl acetate	Fathead minnow *Pimephales promelas*	lab	death	24.00	25	TL_m	48 hr.	1252	Soft water
Vinyl acetate	Fathead minnow *Pimephales promelas*	lab	death	24.00	25	TL_m	96 hr.	1252	Soft water
Vinyl acetate	Fathead minnow *Pimephales promelas*	lab	death	22.17	25	TL_m	24 hr.	1252	Soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus (C) mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No	Remarks
Vinyl acetate	Fathead minnow Pimephales promelas	lab	death	20.31	25	TL_m	48 hr.	1252	Soft water
Vinyl acetate	Fathead minnow Pimephales promelas	lab	death	19.73	25	TL_m	96 hr.	1252	Soft water
Vinyl acetate	Fathead minnow Pimephales promelas	lab	death	39.19	25	TL_m	24 hr.	1252	Hard water
Vinyl acetate	Fathead minnow Pimephales promelas	lab	death	39.19	25	TL_m	48 hr.	1252	Hard water
Vinyl acetate	Fathead minnow Pimephales promelas	lab	death	39.19	25	TL_m	96 hr.	1252	Hard water
Vinyl acetate	Fathead minnow Pimephales promelas	lab	death	36.81	25	TL_m	24 hr.	1252	Hard water
Vinyl acetate	Fathead minnow Pimephales promelas	lab	death	36.81	25	TL_m	48 hr	1252	Hard water
Vinyl acetate	Fathead minnow Pimephales promelas	lab	death	35.75	25	TL_m	96 hr	1252	Hard water
Vinyl acetate	Goldfish Carassius auratus	lab	death	42.33	25	TL_m	24 hr	1252	Soft water
Vinyl acetate	Goldfish Carassius auratus	lab	death	42.33	25	TL_m	48 hr.	1252	Soft water
Vinyl acetate	Goldfish Carassius auratus	lab	death	42.33	25	TL_m	96 hr.	1252	Soft water
Vinyl acetate	Guppy Lebistes reticulatus	lab	death	31.08	25	TL_m	24 hr.	1252	Soft water
Vinyl acetate	Guppy Lebistes reticulatus	lab	death	31.08	25	TL_m	48 hr.	1252	Soft water
Vinyl acetate	Guppy Lebistes reticulatus	lab	death	31.08	25	TL_m	96 hr.	1252	Soft water
Velsicol AR 50g	Harlequin fish Rasbora heteromorpha	lab	death	15.0	18 - 20	TL_m	24 hr.	546	
Velsicol AR 50g	Harlequin fish Rasbora heteromorpha	lab	death	9.2	18 - 20	TL_m	48 hr.	546	

Stimulus	Organism	Experimental site	Response	Stimulus [illegible]	Temp range [illegible]	[illegible]	Rate [illegible]	[illegible]	Remarks
Weedazol	Harlequin fish Rasbora heteromorpha	lab	death	950	18 - 20	TL_m	24 hr.	546	
Weedazol	Harlequin fish Rasbora heteromorpha	lab	death	1350	18 - 20	TL_m	48 hr.	546	
WL 4205	Harlequin fish Rasbora heteromorpha	lab	death	0.55	18 - 20	TL_m	24 hr.	546	
WL 4205	Harlequin fish Rasbora heteromorpha	lab	death	0.50	18 - 20	TL_m	48 hr.	546	
Xylene	Bluegill Lepomis macrochirus	lab	death	24.00	25	TL_m	24 hr.	1252	
Xylene	Bluegill Lepomis macrochirus	lab	death	24.00	25	TL_m	48 hr.	1252	
Xylene	Bluegill Lepomis macrochirus	lab	death	20.37	25	TL_m	96 hr.	1252	
Xylene	Fathead minnow Pimephales promelas	lab	death	28.77	25	TL_m	24 hr.	1252	Soft water
Xylene	Fathead minnow Pimephales promelas	lab	death	27.71	25	TL_m	48 hr.	1252	Soft water
Xylene	Fathead minnow Pimephales promelas	lab	death	26.70	25	TL_m	96 hr.	1252	Soft water
Xylene	Fathead minnow Pimephales promelas	lab	death	28.77	25	TL_m	24 hr.	1252	Hard water
Xylene	Fathead minnow Pimephales promelas	lab	death	28.77	25	TL_m	48 hr.	1252	Hard water
Xylene	Fathead minnow Pimephales promelas	lab	death	28.77	25	TL_m	96 hr.	1252	Hard water
Xylene	Goldfish Carassius auratus	lab	death	36.81	25	TL_m	24 hr.	1252	Soft water
Xylene	Goldfish Carassius auratus	lab	death	36.81	25	TL_m	48 hr	1252	Soft water
Xylene	Goldfish Carassius auratus	lab	death	36.81	25	TL_m	96 hr.	1252	Soft water
Xylene	Guppy Lebistes reticulatus	lab	death	34.73	25	TL_m	24 hr.	1252	Soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. ©	Remarks
Xylene	Guppy Lebistes reticulatus	lab	death	34.73	25	TL_m	48 hr.	1252	Soft water
Xylene	Guppy Lebistes reticulatus	lab	death	34.73	25	TL_m	96 hr.	1252	Soft water
Zectran	Stonefly P. californica	lab	death	0.032	15.5	LC_{50}	24 hr.	687	
Zectran	Stonefly P. californica	lab	death	0.016	15.5	LC_{50}	48 hr.	687	
Zectran	Stonefly P. californica	lab	death	0.010	15.5	LC_{50}	96 hr.	687	
Zinc	Bluegill Lepomis macrochirus		death	measured 7.2 calculated 6.5	25 ± 1	TL_m	20 days	449	
Zinc	Bluegill Lepomis macrochirus		death	measured 7.5 calculated 7.1	25 ± 1	TL_m	20 days	449	
Zinc	Bluegill Lepomis macrochirus		death	measured 10.7 calculated 11.7	25 ± 1	TL_m	20 days	449	
Zinc	Bluegill Lepomis macrochirus		death	measured 10.5 calculated 10.7	25 ± 1	TL_m	20 days	449	
Zinc	Bluegill Lepomis macrochirus		death	measured 12.0 calculated 12.7	25 ± 1	TL_m	20 days	449	

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	R No.	Remarks
Zinc	Bluegill *Lepomis macrochirus*		death	measured 10.7 calculated 9.6	25 ± 1	TL_m	20 days	449	
Zinc	Bluegill *Lepomis macrochirus*	lab	death	6.75	25	TL_m	24 hr.	1130	Soft water
Zinc	Bluegill *Lepomis macrochirus*	lab	death	5.46	25	TL_m	48 hr.	1130	Soft water
Zinc	Bluegill *Lepomis macrochirus*	lab	death	5.46	25	TL_m	96 hr.	1130	Soft water
Zinc	Bluegill *Lepomis macrochirus*	lab	death	7.95	15	TL_m	24 hr.	1130	Soft water
Zinc	Bluegill *Lepomis macrochirus*	lab	death	6.14	15	TL_m	48 hr.	1130	Soft water
Zinc	Bluegill *Lepomis macrochirus*	lab	death	6.44	15	TL_m	96 hr.	1130	Soft water
Zinc	Fathead minnow *Pimephales promelas*	lab	death	.89	25	TL_m	24 hr.	1130	Soft water
Zinc	Fathead minnow *Pimephales promelas*	lab	death	.77	25	TL_m	48 hr.	1130	Soft water
Zinc	Fathead minnow *Pimephales promelas*	lab	death	.77	25	TL_m	96 hr.	1130	Soft water
Zinc	Fathead minnow *Pimephales promelas*	lab	death	3.21	15	TL_m	24 hr.	1130	Soft water
Zinc	Fathead minnow *Pimephales promelas*	lab	death	2.55	15	TL_m	48 hr.	1130	Soft water
Zinc	Fathead minnow *Pimephales promelas*	lab	death	2.55	15	TL_m	96 hr.	1130	Soft water
Zinc	Fathead minnow *Pimephales promelas*	lab	death	not found	15	TL_m	24 hr.	1130	Soft water
Zinc	Fathead minnow *Pimephales promelas*	lab	death	2.70	15	TL_m	48 hr.	1130	Soft water
Zinc	Fathead minnow *Pimephales promelas*	lab	death	2.33	15	TL_m	96 hr.	1130	Soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level mg/l	Temp Range Studied	Rate Function	Rate Effect	Ref. No.	Remarks
Zinc acetate	Fathead minnow *Pimephales promelas*	lab	death	1.03	25	TL_m	24 hr.	1130	
Zinc acetate	Fathead minnow *Pimephales promelas*	lab	death	88	25	TL_m	48 hr.	1130	
Zinc acetate	Fathead minnow *Pimephales promelas*	lab	death	.88	25	TL_m	96 hr.	1130	
Zinc chloride	Bluegill *Lepomis macrochirus*	lab	death	7.24	25	TL_m	24 hr.	1130	
Zinc chloride	Bluegill *Lepomis macrochirus*	lab	death	7.24	25	TL_m	48 hr.	1130	
Zinc chloride	Bluegill *Lepomis macrochirus*	lab	death	5.37	25	TL_m	96 hr	1130	
Zinc oxine	Harlequin fish *Rasbora heteromorpha*	lab	death	0.17	18 - 20	TL_m	24 hr.	546	
Zinc oxine	Harlequin fish *Rasbora heteromorpha*	lab	death	0.10	18 - 20	TL_m	48 hr.	546	
Zinc sulphate	Bluegill *Lepomis macrochirus*	lab	death	6.75	25	TL_m	24 hr.	1130	Soft water
Zinc sulphate	Bluegill *Lepomis macrochirus*	lab	death	5.46	25	TL_m	48 hr.	1130	Soft water
Zinc sulphate	Bluegill *Lepomis macrochirus*	lab	death	5.46	25	TL_m	96 hr.	1130	Soft water
Zinc sulphate	Bluegill *Lepomis macrochirus*	lab	death	5.75	25	TL_m	24 hr.	1130	Soft water
Zinc sulphate	Bluegill *Lepomis macrochirus*	lab	death	5.11	25	TL_m	48 hr.	1130	Soft water
Zinc sulphate	Bluegill *Lepomis macrochirus*	lab	death	4.85	25	TL_m	96 hr.	1130	Soft water
Zinc sulphate	Bluegill *Lepomis macrochirus*	lab	death	6.95	25	TL_m	24 hr	1130	Soft water
Zinc sulphate	Bluegill *Lepomis macrochirus*	lab	death	5.82	25	TL_m	48 hr	1130	Soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus [C] mg/l	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Zinc sulphate	Bluegill Lepomis macrochirus	lab	death	5.82	25	TL_m	96 hr.	1130	Soft water
Zinc sulphate	Bluegill Lepomis macrochirus	lab	death	40.9	25	TL_m	24 hr.	1130	Hard water
Zinc sulphate	Bluegill Lepomis macrochirus	lab	death	40.9	25	TL_m	48 hr.	1130	Hard water
Zinc sulphate	Bluegill Lepomis macrochirus	lab	death	40.9	25	TL_m	96 hr.	1130	Hard water
Zinc sulphate	Fathead minnow Pimephales promelas	lab	death	.96	25	TL_m	24 hr.	1130	Soft water
Zinc sulphate	Fathead minnow Pimephales promelas	lab	death	.96	25	TL_m	48 hr.	1130	Soft water
Zinc sulphate	Fathead minnow Pimephales promelas	lab	death	.96	25	TL_m	96 hr.	1130	Soft water
Zinc sulphate	Fathead minnow Pimephales promelas	lab	death	.88	25	TL_m	24 hr.	1130	Soft water
Zinc sulphate	Fathead minnow Pimephales promelas	lab	death	.78	25	TL_m	48 hr.	1130	Soft water
Zinc sulphate	Fathead minnow Pimephales promelas	lab	death	.78	25	TL_m	96 hr.	1130	Soft water
Zinc sulphate	Fathead minnow Pimephales promelas	lab	death	34.5	25	TL_m	24 hr.	1130	Hard water
Zinc sulphate	Fathead minnow Pimephales promelas	lab	death	33.4	25	TL_m	48 hr.	1130	Hard water
Zinc sulphate	Fathead minnow Pimephales promelas	lab	death	33.4	25	TL_m	96 hr.	1130	Hard water
Zinc sulphate	Goldfish Carassius auratus	lab	death	9.07	25	TL_m	24 hr.	1130	Soft water
Zinc sulphate	Goldfish Carassius auratus	lab	death	6.44	25	TL_m	48 hr.	1130	Soft water
Zinc sulphate	Goldfish Carassius auratus	lab	death	6.44	25	TL_m	96 hr.	1130	Soft water

Stimulus	Organism	Experimental Habitat	Response	Stimulus Level	Temp. Range Studied °C	Rate Function	Rate Effect	Ref. No.	Remarks
Zinc sulphate	Guppy <u>Lebistes</u> <u>reticulatus</u>	lab	death	2.90	25	TL_m	24 hr.	1130	Soft water
Zinc sulphate	Guppy <u>Lebistes</u> <u>reticulatus</u>	lab	death	1.96	25	TL_m	48 hr.	1130	Soft water
Zinc sulphate	Guppy <u>Lebistes</u> <u>reticulatus</u>	lab	death	1.27	25	TL_m	96 hr.	1130	Soft water

APPENDIX B

NUMERIC AL LISTING OF REFERENCES

NUMERICAL LISTING OF REFERENCES

1. Cronin, L.E. Report from management workshop. Chesapeake Sci. 10:292. 1969.

2. Joint Committee on Atomic Energy, U.S. Congress. Hearings before the Joint Committee on Atomic Energy, Congress of the United States, Ninety-first Congress, on environmental effects of producing electric power. U.S. Government Printing Office, Washington, D.C. 4 Vols. 1970.

3. Nash, C. Thermal addition -planning for the future. Chesapeake Sci. 10:279. 1969.

4. Travelers Research Corp. A system analysis of aquatic thermal pollution and its implications. Vol. I. Summary report, Vol. II. Technical report. Prepared for National Coal Policy Conf., Inc., Travelers Research Corp., Hartford, Conn. 1969.

5. Levin, A.A. A comprehensive appraisal of the effects of cooling water discharge on aquatic ecosystems. Battelle Memorial Inst., Columbus, Ohio.

6. Great Lakes Fishery Laboratory. Physical and ecological effects of waste heat on Lake Michigan. U.S. Dept of the Int., Fish and Wildlife Service, unnumbered document 1970.

7. Parker, F.L., and P.A. Krenkel. Thermal pollution status of the art. Vanderbilt Univ., Nashville, Tenn., Dept. of Environmental and Water Resources Engineering, Rept. No. 3. 1969.

8. Coutant, C.C. Biological aspects of thermal pollution I Entrainment and discharge canal effects. CRC Crit Review in Environ. Cont. 1:341. 1970.

9. Coutant, C.C. Thermal pollution–biological effects. *In* A Review of the Literature of 1969 on Wastewater and Water Pollution Control. Jour. Water Poll. Control Fed. 42:1025. 1970.

10. Morgan, J.G., and J.K. Franzreb. Indexed bibliography of thermal effects literature–1. Nuclear Safety Information Center, Oak Ridge Natl. Lab., ORNL-NSIC-81. 1970.

11. Edison Electric Institute. A summary of environmental studies on water problems by investor-owned electric utility companies recently completed, under way, and proposed. EEI Rept. No. 69-47. 1969.

12. Brett, J.R. Temperature-animals-fishes. *In:* Marine ecology, Vol. I. Environmental Factors, Part 1. O. Kinne (ed.), Wiley-Interscience, New York, N.Y. p. 515. 1970.

13. Brett, J.R. Resume: temperature and fish. Chesapeake Sci 10:275. 1969.

14. Brett, J.R. Fish–the energy cost of living. *In:* Marine Agriculture W.J. McNeil (ed.), Oregon State Univ. Press, Corvallis, p. 37. 1970.

15. Prosser, C.L. Principles and general concepts of adaptation. Environ. Res. 2:404. 1969.

16. DeCola, J.N. Water quality requirements for Atlantic salmon. FWQA, U.S. Dept. of Int., Publ. No. OWT 10-16. 1970.

17. Jensen, L.D. The effects of elevated temperature upon aquatic invertebrates. Johns Hopkins Univ., Baltimore, Md., Prep. for Edison Elect. Inst. Res. Proj. No. 49; EEI Publ. No. 69-900. 1969.

18. Costlow. J.D., and C.G. Bookout. Temperature and meroplankton. Chesapeake Sci. 10:253. 1969.

19. Vernberg, F.J., and W.B. Vernberg. Thermal influence on invertebrate respiration. Chesapeake Sci. 10:234. 1969.

20. Weglenska, T. The effect of temperature and food on the development, individual growth and fertility of zooplankton. Wiadomosci Ekologiczne (Pol.) 16:1. 1970.

21. Castenholz, R.W Thermophilic blue-green algae and the thermal environment. Bacteriol. Rev. 33:476. 1969.

22. Heinle, D.R. Temperature and zooplankton. Chesapeake Sci. 10:186. 1969.

23. Heinle, D.R. The effects of temperature on the population dynamics of estuarine copepods. Ph.D. thesis, Univ. of Maryland, College Park (1969); Dissertation Abs. 31:448-B. 1970.

24. Cory, R.L., and J.W. Nauman. Epifauna and thermal additions in the Upper Patuent River estuary. Chesapeake Sci. 10:210. 1969.

25. Anderson, R.R. Temperature and rooted aquatic plants. Chesapeake Sci. 10:157. 1969.

26. Buck, J.D. Summary report, Connecticut River microbiology, October 1965-September 1969. FWQA Contract No. 14-12-177, Final Rept., Processed. 1970.

27. Bader, R.G., and D.C. Tabb An ecological study of South Biscayne Bay in the vicinity of Turkey Point. Prog. Rept. to U.S.A.E.C., Univ. of Miami, Fla. 1970

28. Zieman, J.C., Jr. The effects of a thermal effluent stress on the sea-grasses and macro-algae in the vicinity of Turkey Point, Biscayne Bay, Florida. Univ. of Miami, Coral Gables, Fla., Processed. 1970.

29. Nugent, R.S. The effects of thermal effluent on some of the macrofauna of a subtrophical estuary. Stud. in Estuarine and Coastal Pollution, Techn. Rept. No. 1, School of Marine and Atmos. Sci., Univ. of Miami, Miami, Fla. 1970.

30. Coutant, C.C. Temperature, reproduction and behavior. Chesapeake Sci. 10:261. 1969.

31. Gammon, J.R. Aquatic life survey of the Wabash River, with special reference to the effects of thermal effluents on populations of macroinvertebrates and fish. Processed Rept. 1970.

32. Hechtel, G.J. Biological effects of thermal pollution, Northport, New York. Marine Sciences Res. Center. State Univ. of New York, Stony Brook. Tech Rept. 1970.

33. Oglesby, R.T., and D.J. Alle (eds.). Ecology of Cayuga Lake and the proposed Bell Station (nuclear powered). Water Resources and Marine Sciences Center, Publ. No. 27, Cornell Univ., Ithaca, N.Y. 1969.

34. Barnett, P.R.O., and B.L.S. Hardy The effects of temperature on the benthos near the Hunterston Generating Station, Scotland Chesapeake Sci. 10:255. 1969.

35. Pearce, J.B. Thermal addition and the benthos, Cape Cod Canal. Chesapeake Sci. 10:227. 1969.

36. Drew, H.R., and J.E Tilton. Thermal requirements to protect aquatic life in Texas Reservoirs. Jour. Water Poll. Control Fed. 42:562. 1970.

37. Beer, L.P., and W.O. Pipes. A practical approach to the preservation of the aquatic environment: the effects of discharge of condenser water into the Illinois River Industrial Bio-Test Lab Rept No. W 7178. 1970.

38. Normandeau. D.A. The effects of thermal releases on the ecology of the Merrimack River. Rept. to Public Service Co. of New Hampshire.

39. Adair, W.D., and D.J. DeMont. Effects of thermal pollution upon Lake Norman fishes. North Carolina Wildlife Res. Comm., Summary Rept. Job IX-C. Raleigh. N.C 1970.

40. Havey, K.A., and R.M. Davis Factors influencing standing crops and survival of juvenile salmon at Barrows Stream. Maine. Trans.. Amer. Fish Soc 99:297. 1970.

41. Minshall, G.W The Plecoptera of a headwater stream (Gaitscale Gill, English Lake District) Arch Hydrobiol (Ger.) 65:494. 1969

42. Vernberg, F.J., and W.B. Vernberg Lethal limits and the zoogeography of the faunal assemblages of coastal Carolina waters. Marine Biol. (W. Ger.) 6.26 1970

43. Nusch, E.A. Ecological and systematic studies of the peritricha (protozoa. ciliata) in the periphyton community of reservoirs and damned rivers with different degrees of saprobity. Arch. Hydrobiol.. Supple. 37 (Ger.) 3:243 1970.

44. Larkin, J.M. Seasonal incidence of bacterial temperature types in Louisiana soil and water Appl. Microbio 20:286. 1970.

45. Basedow, T. Effect of temperature shock on the temperature resistance of poikilotherm aquatic animals. Experiments on the problem of heat- and cold-hardening in animals. Intl. Rev. Gesamten Hydrobiol. (Ger.) 54:765. 1969.

46. Coutant, C.C. Thermal resistance of adult coho (*Oncorhynchus kisutch*) and Jack Chinook (*O. tshawytscha*) salmon, and adult steelhead trout (*Salmo gairdneri*) from the Columbia River. U.S. AEC Res and Develop. Rept No BNWL-1508, Battelle-Northwest, Richland. Wash. 1970

47. Singh, S.B. Preliminary observations on response of youngs of Chinese carps to various physiochemical factors of water. Proc. Natl. Acad Sci. India, Sect. B. (Biol. Sci.) 37:320, 1967. Biol Abs. 51 53080. 1970.

48. Sassaman, C., and C.P. Mangum. Patterns of temperature adaptation in North American Atlantic Coastal Actinians. Marine Biol. (W. Ger.) 7:123. 1970.

49. Cairns. J., Jr. The response of fresh-water protozoan communities to heated waste waters. Chesapeake Sci. 10:177. 1969.

50. Biebl, R. Heat resistance studies in the intertidal alga *Chaetomorpha cannabina* (Aresch.) Kjellm. Protoplasma (W. Ger.) 67:451, 1969; Biol. Abs. 51:52986, 1970.

51. Biebl, R. Comparative studies on temperature hardiness of marine algae along the Pacific Coast of North America. Protoplasma (W. Ger.) 69:61, 1970; Biol. Abs. 51:76185, 1970.

52. McErlean, A.J. Determination of upper temperature tolerance triangles for aquatic organisms. Chesapeake Sci. 10:293. 1969.

53. Berenbeim, D.Y. The effect of water temperature on the spawning time of the Atlantic and Pacific mackerel. Tr. Kaliningrad. Tekh. Inst. Ryb. Prom. Khoz. (USSR) 20:63, 1968; Biol. Abs. 51:53070, 1970.

54. Mohammad, M.B.M. Effects of temperature and salinity on the development of *Axiothella muscosa* (Andrews). Bull. Biol. Res. Cent. (Iraq) 2:1, 1966; Biol. Abs. 51:104767, 1970.

55. Ong, K., and J.D. Costlow The effect of salinity and temperature on the larval development of the stone crab, *Menippe mercenaria* (Say). Reared in the laboratory. Chesapeake Sci. 11:16. 1970.

56. Lock. A R and I.A. McLaren. The effect of varying and constant temperatures on the size of a marine copepod. Limnol. & Oceanog. 15:638. 1970

57. Lutz, R.A. Acute temperature increase as a stimulus to setting in the American oyster, *Crassostrea virginica* (Gmelin). Proc. Nat. Shellfish Assn. 60:68, 1969; Biol. Abs. 51. 1970.

58. Becker. C.D. Temperature, timing and seaward migration of juvenile Chinook Salmon from the Central Columbia River. U.S. AEC Res. and Develop Rept. No. BNWL-1472, Battelle-Northwest, Richland. Wash. 1970.

59. Moss, S.A. The responses of Young American Shad to rapid temperature changes. Trans. Amer. Fish. Soc. 99:381. 1970.

60. Kunnemann, H. The influence of temperature changes on enzymes of fish muscles. Experiments with Golden Orfs *Indus idus* Marine Biol. (W. Ger.) 7:71. 1970.

61. Newell R.C and V.I. Pye. Seasonal changes in the effect of temperature on the oxygen consumption of the Winkle *Littorina littorea* (L.) and the Mussel *Mytilus edulis* L. Comp. Biochem, Physiol. 34:367. 1970.

62. Meincke K.F. The influence of temperature variations on the ion and water content in blood plasma and tissues of *Tinca tinca* Marine Biol. (W. Ger.) 6:281. 1970.

63 Drost-Hansen, W Allowable thermal pollution limits–a physico-chemical approach. Chesapeake Sci. 10:281. 1969.

64. Barkman R.C A study of the mechanism of temperature acclimation of the Crayfish *Orconectes rusticus*. Ph.D.

thesis, Univ. of Cincinnati, Ohio, 1969; Dissertation Abs. 30:5206-B, 1970.

65. Wolfe, D.A., and C.B. Coburn. Influence of salinity and temperature on the accumulation of Cesium-137 by an estuarine clam under laboratory conditions. Health Phys. 18:499. 1970.

66. Duke, T. Influence of environmental factors on the concentrations of Zn by an experimental community. Proc. 2nd Natl Symp. on Radioecology, D.J. Nelson and F.C. Evans (eds.), U.S. AEC Doc. No. CONF-670503:355. 1969.

67. Harvey, R.S. Temperature effects on the sorption of radionuclides by freshwater algae. Health Phys. 19:293. 1970.

68. Eisler, R. Acute toxicities of insecticides to marine decapod crustaceans. Crustaceana 16:302. 1969; Biol. Abs. 51:84862, 1970.

69. Amend, D.F. Control of infectious hematopoietic necrosis virus disease by elevating the water temperature. Jour. Fish. Res. Bd. Can. 27 265. 1970.

70. Carlucci, A.F. Influence of temperature and solar radiation on persistance of vitamin B12 thiamine and biotin in seawater. Jour. Phycol. 5:302, 1969; Biol. Abs. 51:70531, 1970.

71. Lorenzen, H., and G.S. Venkatarama. Synchronous cell divisions in *Anacystis nidulans* Richter. Arch. Mikrobiol. (Ger.) 67:251, 1969; Biol. Abs. 51:68915, 1970.

72. Berglund, H. On the cultivation of multicellular marine green algae in axenic culture. Svensk. Bot. Tidskr. (Swed.) 63:251, 1969; Biol. Abs. 51:57385, 1970.

73. Patrick, R. Temperature and manganese as determining factors in the presence of diatom or blue-green algal floras in streams. Proc. Nat. Acad. Sci. 64:472, 1969; Water Res. Abs. 3·W70-07257, 1970.

74. McDonnell, A.J., and S.D. Hall. Effect of environmental factors on benthal oxygen uptake. Jour. Water Poll. Control Fed. 41:R353. 1969.

75. Kiner, A., and P. Lamarque. A short note on the rearing of tilapia in a particular environment in the southwest of France. Verh. Intl. Ver. Limnol. (Ger.) 17:662 1969.

76. Ansell, A.D. Thermal releases and shellfish culture possibilities and limitations. Chesapeake Sci. 10:256. 1969

77. Olson, P.A. Effects of thermal increments on eggs and young of Columbia River Fall Chinook. U.S. AEC Res. and Develop. Rept. No. BNWL-1538, Battelle-Northwest, Richland, Wash. 1970.

78. Strawn, K., and B.J. Gallaway. Final report on the seasonal abundance. distribution, and growth of commercially important crustaceans at a hot water discharge in Galveston Bay, Texas. Texas A&M Res. Foundation Rept. to Elect. Utilities Comm. on Water Qual. 1970.

79. Pacific Northwest Water Laboratory. Water temperature, influences, effects, and control. Proceedings of the 12th Pacific Northwest Symposium on Water Pollution Research, Pacific Northwest Water Laboratory, Public Health Service, U.S. Department of Health, Education and Welfare, 1963.

80 Bailey, R.M. Differential mortality from high temperatures in a mixed population of fishes in Southern Michigan. Ecology, 36(3):526-528 1955.

81. Belchradek. J. Temperature coefficients in biology. Biology Review 5(1):30-58. 1930.

82. Belding, D.L. Water temperature and fish life. Trans. Amer. Fish. Soc. 58:98-105. 1928

83. Bishai, H.M. Upper lethal temperatures for larval salmonids. Journal du Conseil. 25(2):129-133. 1960, Sport Fisheries Abstracts Vol. 5, No. 4, 1960.

84. Bisset, K.A. The effect of temperature on non-specific infections of fish. Jour. of Pathology and Bacteriology 58(2):251-258. 1946.

85. Black, E.C. Upper lethal temperatures on some British Columbia fresh water fishes Jour. Fisheries Research Board of Canada 10:196-210. 1953.

86. Blaxter, J.H.S. Herring rearing, III–The effect of temperature and other factors on myotome counts. Scottish Home Department, Marine Research No. 1. 1957. 16 p.

87. Bonnet, D.D. Mortality of the cod egg in relation to temperature. Biology Bulletin, Wood's Hole 65:428-441. 1939.

88. Boyer, Peter B. Method of computing average reservoir temperature. Water Temperature, Influences, Effects and Control, Proceedings of the 12th Pacific Northwest Symposium on Water Pollution Research, Pacific Northwest Laboratory, U.S. Department of Health, Education and Welfare. 1963.

89. Breder, C.M., and R.F. Nigrelli. Influence of temperature and other factors on the winter aggregation of the sunfish, *Lepomis auritus*, with critical remarks on the social behavior of fishes. Ecology 16(1):33-47. 1935.

90. Brett, J.R. Implications and assessments of environmental stress. Investigations of Fish–Power Problems, University of British Columbia. pp 69-83. 1958.

91. Brett, J.R. Some lethal temperature relations of Algonquin Park fishes. Biology Series 52, University of Toronto Studies (Publication, Ontario Fisheries Research Laboratory, No. 63). pp. 1-49. 1944.

92. Brett, J.R. Some principles in the thermal requirements of fishes. Quarterly Review of Biology 31(2):75, 1958; List No. 5 Ontario Fisheries Research Laboratory, 1958.

93. Brett, J.R. Temperature tolerance in young Pacific salmon, genus *Onchorhyncus*. Jour Fisheries Research Board of Canada 9:265. 1952.

94. Brett, J.R. Thermal requirements of fish–three decades of study, 1940-1970. Technical Report W 60-3. Transactions of the Seminar on the Biological Problems of Water Pollution, Public Health Service, U.S. Department of Health, Education and Welfare, Washington, D.C. 1960.

95. Bridges, W.R. Biological problems in water pollution: effects of time and temperature on the toxicity of heptachlor and kepone to redear sunfish. Third Seminar: 1962, Publication No. 99-WP-25, Public Health Service, U.S. Department of Health, Education and Welfare, Washington, D.C. 1965.

96. Brown, L.A. The natural history of cladocerans in relation to temperature: I: distribution and the temperature limits for vital activities. The American Naturalist 63:248-264. 1929.

97. Baldwin, N.S. Food consumption and growth of brook trout at different temperatures. Trans., Amer. Fish. Soc. 86:323-328. 1957.

98. Bardach, John E., and Richard G. Bjorklund. The temperature sensitivity of some American fresh-water fishes. The American Naturalist 91(859):233-251. 1957.

99. Burnson, B. Seasonal temperature variations in relation to water treatment. Jour.. Americal Water Works Association 30:793 1938.

100. Cadwallader, L.W. Thermal pollution of streams. Paper presented to the 15th Annual Meeting of the Virginia Water Pollution Control Association at Old Point Comfort, Va.. May 8-9, 1961.

101. Cadwallader, L.M. Thermal pollution of water courses. Proceedings, 19th Industrial Waste Conference at Purdue University, Lafayette, Ind. p. 9. 1964.

102. Cairns, J., Jr. Effects of heat on fish. Industrial Wastes, pp. 180-183, May-June 1956.

103. Cairns, J., Jr. The effects of increased temperatures upon aquatic organisms. Proceedings of the 10th Industrial Waste Conference. Purdue University Engineering Bulletin 40(1):346. 1956.

104. Cairns, J., Jr. The effects of periodic low oxygen upon the toxicity of various chemicals to aquatic organisms. Academy of Natural Sciences of Philadelphia, Pa.

105. Cairns, John, Jr. The effects of sublethal levels of zinc and of high temperature upon the toxicity of a detergent to the sunfish *Lepomis gibbosus* (Linn). Notulae Naturae, No. 367, June 26, 1964

106. Cairns, John, Jr The effects of temperature and hardness of water upon the toxicity of zinc to the common bluegill Notulae Naturae. No 299, June 21, 1957

107. Cairns, John, Jr The effects of temperature and hardness of water upon the toxicity of zinc to the pond snail, *Physa heterostropha* (Say). Notulae Naturae, No. 308, July 18. 1958.

108. Cairns, J., Jr and A. Scheier. The effects of temperature and water hardness upon the toxicity of naphthenic acids to the common bluegill sunfish, *Lepomis macrochirus* Raf. and the pond snail, *Physa heterostropha*, Say, Notulae Naturae 353:1-12. 1962.

109. Cairns, J., Jr., and A. Scheier. The effects of temperature and hardness of water upon the toxicity of potassium dichromate to the common bluegill sunfish. Transactions, N.E. Wildlife Conference, 1958; Sport Fisheries Abstracts. Vol. 6, No. 1, 1961.

110. Carbaugh, H.C. Thermal pollution problems. Paper presented at the 1965 Annual Meeting of the Indiana Water Pollution Control Association at Indianapolis, Ind November 16, 1965.

111. Chalkley, H.W High lethal temperature, paramecium. Physiological Zoology 3:425-440. 1930.

112. Chang, S.L., M Buckingham, and M.P. Taylor. Studies on *Leptospira icterohaemorrhagine* IV. Survival in water and sewage, destruction in water by halogen compounds, synthetic detergents and heat. Jour. of Infectious Diseases 82:256. 1948.

113. Beamish, F.W.H. Respiration of fishes with special emphasis on standard oxygen consumption II. Influence of weight and temperature on respiration on several species. Canadian Jour. of Zoology, Vol. 42. 1964.

114. Black, V.S., F.E.J. Fry, and Edgar C. Black. The influence of temperature on the respiratory tolerance of young goldfish. Proceedings, Nova Scotia Institute of Science 121:659. 1947.

115. Breder, C.M., Jr. On the temperature-oxygen tolerance of brook trout. Copeia 163:36-39. 1927.

116. Chidester, F.E. A critical examination of the evidence for physical and chemical influences on fish migration. British Jour. of Experimental Biology 2:79-118. 1924.

117 Churchill, M.A. Natural reduction of paper mill color in streams. Sewage and Industrial Wastes 23:661. 1951.

118. Clark, J.R. et al. Effects of thermal loadings on stream sanitation criteria. Paper presented at the 27th Annual Meeting of the FS and IWA at Cincinnati, Ohio, October 12, 1954.

119. Clemens. H.P , and K.E. Sneed. Effect of temperature and physiological condition on tolerance of channel catfish to pyridylmercuric acetate (PMA). Progressive Fish Culturist 20(4):147-150. 1934.

120. Cocking, A.W. The effects of high temperature on roach (*Rutilus rutilus*): I. The effects of constant high temperature: II. The effects of temperature increasing at a known constant rate. Jour. of Experimental Biology 36(1):203-226. 1959.

121. Coker, R.E. Influence of temperature on size of fresh water copepods (Cyclops). Internat. Rev. Ge Hydrobiol. and Hydrograph. 29(5/6):406-438. 1933.

122. Combs, B.D., and R.E. Burrows. Threshold temperatures for the normal development of chinook salmon eggs. Progressive Fish Culturist 19(1):3-6. 1957.

123. Costow, J.D. Biological problems in water pollution: the effect of environmental factors on larval development of crabs. Third Seminar: 1962, Publication No. 999-WP-25, Public Health Service, U.S. Department of Health, Education and Welfare. 1965.

124 Craigie, David E. An effect of water hardness in the thermal resistance of the rainbow trout, *Salmo gairdnerii* Richardson. Canadian Jour. of Zoology 41(5):825-830. 1963.

125. Crawford, D.R. Some considerations in the study of the effects of heat and light on fishes. Copeia 73:89-92. 1930.

126. Creaser, E.W. Relative importance of hydrogen-ion concentration, temperature, DO and CO_2 on habitat selection by brook trout. Ecology 11:246-262. 1930.

127 Dannewig, H. The influence of temperature on the development of the eggs of fishes. Report, Fisheries Board of Scotland 13:147-153. 1894.

128. Delay. William H. Temperature studies on the Umpqua River, Oregon. Water Temperature Influences, Effects, and Control, Proceedings of the 12th Pacific Northwest Sympo-

sium on Water Pollution Research, Pacific Northwest Water Laboratory, Public Health Service, U.S. Department of HEW. 1963.

129. Dickie. L.M. Water temperature and survival of giant scallop. Trans. Amer. Fish. Soc. 88(1):73. 1959.

130. Donaldson, L.R., and F.J. Foster. Experimental study of the effect of various water temperatures on the growth, food-utilization, and mortality rate of fingerling sockeye salmon. Trans. Amer. Fish. Soc. 70:339-346. 1941.

131. Doudoroff, P. Reactions of marine fishes to temperature gradients. Biology Bulletin 75(3):494-509. 1938.

132. Doudoroff, P. The resistance and acclimatization of marine fishes to temperature changes. I. Experiments with *Girella nigricans* (Ayres). Biology Bulletin 83(2):219-244 1942.

133. Doudoroff. P. The resistance and acclimation of marine fishes to temperature changes, II. Experiments with fundulus and atherinops. Biology Bulletin 88(2):194-206 1945.

134. Downing, K.M., and J.C. Merkens. The influence of temperature on the survival of several species of fish in low tensions of dissolved oxygen. Annals of Applied Biology 45(2):261-267 1957.

135. Duttwiler, D.W. A mathematical model of stream temperature. Thesis presented to The Johns Hopkins University at Baltimore. Md., in 1963, in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

136. Dzyan, Yao-Tsin. Changes in the temperature preferences of certain species of sturgeon at varying levels of food supply. Nauch. Soobscheniya Inst. Fiziol Akad, Nauk. SSSR, 1:125-127. 1959; Referat, Zhur., Biol, No. 4D74. 1961; Sport Fisheries Abstracts. Vol. 7, No. 2, 1962.

137. Edwards, R W. The relation of oxygen consumption to body size and to temperature in the larvae of chironomus Jour. of Experimental Biology, Vol. 35. 1958.

138. Ellis, M.M. Temperature and fishes. Fishery Leaflet 221 U.S. Fish and Wildlife Service. 1947.

139. Elson, P.F. Effects of current on the movement of speckled trout. Jour., Fisheries Research Board of Canada 4:517-520. 1940.

140. Embody, G.C. Concerning high water temperatures and trout. Trans. Amer. Fish. Soc. 51:58-64. 1921

141. Enropeyzena, N.V. Preferred temperatures of fish larvae C.R. Acad, Science, Moscow, N.S. 42(3):138-142 1944.

142. Evans, R.M., F.C. Puride, and C.O. Hickman, Jr The effect of temperature and photoperiod on the respiratory metabolism of rainbow trout, *Salmo gairdneri*. Canadian Jour. of Zoology 40(1):107-118. 1962.

143. Everts, Curtiss M. Temperature as a water quality parameter. Water Temperature, Influences, Effects and Control, Proceedings of the 12th Pacific Northwest Symposium on Water Pollution Research, Pacific Northwest Water Laboratory, Public Health Service, U.S. Department of HEW. 1963.

144. Fraenkel, G., and H.S Hapf. The physiological action of abnormally high temperatures in Poikilothermic animals. I. Temperature adaptation and the degree of saturation of the phosphatides. Biochemistry Jour. 34(7):1085-1092 1940

145. Freeman, J.A. Oxygen consumption, brain metabolism and respiratory movements of goldfish during temperature acclimatization, with special reference to lowered temperatures. Biology Bulletin. Wood's Hole 99:416-424. 1950.

146. Frey, David G. Limnology in North America. University of Wisconsin Press, Madison. 1963.

147. Friedlander, S.K., and L. Topper. Turbulence. Classical Papers on Statistical Theory, Interscience Press, New York. 1961.

148. Friedman, S.J. Heat losses from tanks, vats, and kettles. Heating and Ventilating, Reference Section, Apr. 1948.

149. Fry, F.E.J. Requirements for the aquatic habitat. Pulp Paper Magazine of Canada Technical Section, Feb. 1960.

150. Fry, F.E.J. Some temperature relations of fish. Fed. Proc., 10(1):46. 1951

151. Fry, F.E.J. Temperature compensation. American Review of Physiology 20:207-224 1958.

152. Fry, F.E.J. Temperature relations of salmonoids. Proceedings, 10th Meeting of the National Commission of Fisheries Cult. Appendix D.

153. Fry, F.E.J. Temperature relations in salmonoids. Proceedings, 1st Meeting of the Canadian Commission of Fresh Water Fisheries Research. Appendix D. 1948.

154. Fry, F.E.J. The lethal temperature as a tool in taxonomy. Annee Biologique 33(5-6):205-219 1957.

155. Fry, F.E.J., V.S. Black, and E.C. Black Influence of temperature on the asphyxiation of young goldfish (*Carassius auratus* L.) under various tensions of oxygen and carbon dioxide. Biology Bulletin 92(3):217-224. 1947.

156. Fry, F.E.J., R. Brett, et al. Temperature acclimatization. Fish Rev. Canada Biolgie 1.50-56. 1942.

157 Fry, F.E.J., J.S. Hart, and K.F. Walker Lethal temperature relations for a sample of young speckled trout, *Salvelinus fontinalis*. Biology Series No. 54, University of Toronto Studies (Publication Ontario Fisheries Research Laboratory, No. 66) pp. 9-34. 1946.

158. Fry, F.E.J., and B. Pearson. Temperature preference, lethal temperatures, cruising speed of the bluegill. Manuscript in the Ontario Fisheries Research Laboratory Library, Toronto. 1952.

159. Galloway, J.C. Lethal effects of the cold winter of 1939-40 on marine fishes at Key West, Florida. Copeia 2:118-119. 1951.

160. Gameson, A.L.H., J.W Gibbs, and M.S. Barrett. A preliminary temperature survey of a heated river. Water and Water Engineering, London 63(755):13. January 1959.

161. Gaufin, Arden R. Biological problems in water pollution: environmental requirements of plecoptera. Third Seminar: 1962, Publication No. 999-WP-25, Public Health Service, U.S. Department of HEW. 1965.

162. Gaufin, Arden R. Environmental changes in a polluted stream during winter. The American Midland Naturalist 54(1):78-88. July 1955.

163. Gaufin, A.R., and C.M. Tarzwell. Aquatic invertebrates as indicators of stream pollution. Public Health Reports 67(1):57-64. 1952.

164. Gibson, M. Beatrice. Upper lethal temperature relations of the guppy, *Lebistes reticulatus*. Canadian Jour. of Zoology 32:393. 1954.

165. Gilberts, D.E. Investigations of thermal additions to rivers. Paper presented at the 38th Annual Meeting of the Central States Water Pollution Control Association held at Albert Lea, Minn., June 9-11, 1965.

166. Gotaas, H.B. Effect of temperature on biochemical oxidation of sewage. Sewage Works Jour. 20(3):441. May 1948.

167 Graham, J.M. Some effects of temperature and oxygen pressure on the metabolism and activity of the speckled trout, *Salvelinus fontinalis*. Canadian Jour. of Research, Series D. 27:270-288. 1949.

168. Gunn, D.L. Body temperature in poikilothermal animals. Biology Review 17:293-314. 1942.

169. Gunter, G. Treatise on marine ecology and paleoecology; temperature. Memoirs, Geological Society of America 1(67):159-184. 1957.

170. Haskell, D.C., L.E. Wolf, and Loyal Bouchard. The effect of temperature on the growth of brook trout. New York Fish and Game Jour 3(1):108-113, 1956; Sport Fisheries Abstracts Vol. 2, No. 1. 1956.

171. Hatfield, H.F The effects of the discharge of warm water to rivers. Proceedings, 21st Annual Water Conference, at Pittsburgh, Pa., Oct 25, 1960. p 102.

172. Hathaway, E.S. The relation of temperature to the quantity of food consumed by fishes. Ecology 8(4):428-434. 1927.

173. Havgaard, N., and L. Irving. The influence of temperature upon oxygen consumption of the cummer (*Tautogolubrus adspersus*, Walbaum) in summer and winter. Jour. of Cellular and Camp Physiology 21:19-26. 1943.

174 Hayes, F.R. The growth, general chemistry and temperature relations of salmonid eggs. Quarterly Review of Biology 24:281-308. 1949.

175. Higurashi, T. Optimum water temperature for hatching the eggs of *Hypomesus alidus*, Pallas. Jour., Imperial Fisheries Institute, Tokyo 21:2-5. 1925.

176 Higurashi, I., and M. Tauti. On the relation between temperature and the rate of development of fish eggs. Jour., Imperial Fisheries Institute, Tokyo 21:5-9. 1925.

177. Hoak, Richard D. Defining thermal pollution. Power Engineering, December 1961.

178. Hoak, Richard D. Thermal loading of streams. Water Resources Research Projects, Mellon Institute, Pittsburgh, Pa. 1962.

179 Hoar, W.S., and M.K. Cottle. Dietary fat and temperature tolerance of goldfish. Canadian Jour. of Research, Zool. 30:41-48. 1952.

180. Hoar, W.S., and M.K. Cottle. Some effects of temperature acclimatization on the heat tolerances of goldfish (*Carassius auratus*). Canadian Jour. of Resarch D27:85-91. 1952.

181. Hoar, W.S., and J.E.C. Dorchester. Effect of dietary fat on the heat tolerance of goldfish (*Carassius auratus*). Canadian Jour. of Research 27:85-91. 1949.

182. Hubbs, Clark. Minimum temperature tolerances for fishes of the genera *Signalosa* and *Herichthys* in Texas. Copeia 4:297. 1951.

183. Huntsman, A.G., and M.I. Sparks. Limiting factors for marine animals, 3. Relative resistance to high temperature. Contr. Can. Biol. 2:102-113. 1924.

184. Huntsman, A.G. Death of salmon and trout with high temperature. Jour., Fisheries Research Board of Canada 5:485-501. 1942.

185. Hutchinson, G.E. A treatise on limnology, Vol. 1. John Wiley & Sons, Inc., New York. 1957.

186. Ide, F.P. Effects of temperature on the distribution of the mayfly fauna of a stream. Biology Series 39. University of Toronto Studies, pp. 9-76. 1939.

187. Irving, L., E.C. Black, and V. Safford. The influence of temperature upon the combination of oxygen with the blood of trout. Biology Bulletin 80:1-17. 1941.

188. Jaske, R.T. Some observations of Columbia River and Reservoir behavior from Hanford experience. Water Temperature, Influences, Effects, and Control, Proceedings of the 12th Pacific Northwest Symposium on Water Pollution Research, Pacific Northwest Water Laboratory, Public Health Service, U.S. Department of HEW. 1963.

189. Johnson, M.G., and W.H. Charlton. Some effects of temperature on the metabolism and activity of the largemouth bass, *Micropterus salmoides lacepede* Progressive Fish Culturist 22:155 1960.

190. Jones, J.R. Erichsen. Fish and river pollution. Butterworth and Co. Ltd., London. 1964

191. Kawajiri, M. The influence of variation of temperature of water on the development of fish eggs. On the relation of growth and death from starvation of the trout fly to temperature. On the studies of the population-density of cultured fishes. Jour., Imperial Fisheries Institute, Tokyo 24:1-12. 1928.

192. Kawajiri, M. The optimum temperature of water for the hatchings of eggs of trout. *Oncarhynchus masacu* (Walbaum). Jour., Imperial Fisheries Institute, Tokyo 23:14-18. 1927.

193. Klein, Louis Aspects of river pollution. Academic Press, New York, p. 39. 1957.

194. Klein, Louis. River pollution Vol. II. Causes and effects. Butterworth and Co., Ltd., London. 1962.

195. Knight, Allen W Relative importance of varying oxygen concentration, temperature, and water flow on the mechanical activity and survival of the plecoptera nymph, *Pteronarcys californica* Newport. Proceedings, Utah Academy of Sciences, Arts and Letters, Vol. 41, Part I. 1964.

196. Kuroki, Toshiro On the relation between water temperature and the response for stimuli, the investigation to decide the 'optimum temperature.' Memoirs, Faculty of Fisheries Kagoshima University, Japan, 3(2):19-24, 1954; Sport Fisheries Abstracts, Vol. 4, No. 3, 1959.

197. Loeb, J., and H. Wastenys. On the adaptation of fish (fundulus) to high temperature Jour of Experimental Zoology 12:543-557. 1912.

198. Lund, J W.G., and J.F. Talling. Botanical limnological methods with special reference to the algae The Botanical Review 23:489-583. 1957.

199. McCauley R.W Lethal temperatures of the developmental stages of the sea lamprey, *Petromyzon marinus* L Jour Fisheries Research Board of Canada 20:483. 1963. Jour Water Pollution Control Federation 37(7) 796. 1964.

200. McCombie, A.M. Actions and interactions of temperature. light intensity and nutrient concentration on the growth of the green alga, *Chlamydomonas reinhardi* Dangeard. Jour Fisheries Research Board of Canada 17(6):871 1960

201. McCracken, F.D., and S.H. Starkman. Preliminary observations on the preferred temperature of the perch. Manuscript in the Ontario Fisheries Research Laboratory Library, Toronto 1948.

202. McEwen, George F. A mathematical theory of the vertical distribution of temperature and salinity in water under the action of radiation, conduction, evaporation, and mixing due to the resulting convection Bulletin, Scripps Institute of Oceanography, LaJolla, Calif., Technical Series 2 No. 6. University of California Press. 1929

203 McFarland, W.M. Upper lethal temperatures in the salamander. *Taricha torosa*, as a function of acclimation Copeia 3:191-194. 1955

204 McKinney, R.I Microbiology for sanitary engineers. McGraw-Hill Book Co., New York 1962.

205. McLeese, D.W. Effects of temperature, salinity, and oxygen on the survival of the American lobster Jour Fisheries Research Board of Canada 13(2):247 1956

206. Miller, William T Possible relationship of water temperatures with availability and year class size in the Pacific sardine Thesis presented to Stanford University at Stanford. Calif., in 1956, in partial fulfillment of the requirements for the degree of Master of Arts

207. Moore, A M. Instrumentation for water-temperature studies Water Temperature, Influences, Effects and Control Proceedings of the 12th Pacific Northwest Symposium on Water Pollution Research. Pacific Northwest Water Laboratory, U.S. Department of HEW 1963

208. Moore, E.W. Thermal pollution of streams Industrial and Engineering Chemistry 50(4):87A-88A. Apr 1958. Reprint No. 23. Division of Engineering and Applied Physics, Harvard University, Cambridge. Mass.

209. Moore, Walter G. Field studies on the oxygen requirements of certain freshwater fishes. Ecology 23 319-329 1942

210. Musacchia. J., and M.R. Clark. Effects of elevated temperatures on tissue chemistry of the Arctic sculpin *Myxocephalus quadricornis*. Physiological Zoology 30(1):12-17 1957

211. Olson P.A. Temperature tolerance of eggs and young of Columbia River fish. Hanford Biology Research Annual Report for 1957, Office of Technical Services. U.S Department of Commerce, Washington, D.C p 211 1958

212. Olson, P.A., and R F Foster Temperature tolerance of eggs and young of Columbia River chinook salmon. Trans., Amer. Fish. Soc. 85 203. 1957

213 Olson, T. Effect of biological life on the addition of heat to river water. Paper presented at the 38th Annual Meeting of the Central States Water Pollution Control Association at Albert Lea, Minn June 9-11 1965.

214. Orska, J. The influence of temperature on the development of the skeleton in teleosts. Zool. Polaniae 7(3):272-325. 1956.

215 Oya, T., and M. Kimata Oxygen consumption of fresh water fishes. Bulletin Japan Society of Scientific Fisheries 6(6) 287-290. 1938

216 Patrick, Ruth, and E.W Cadwallader The effects of high temperatures on aquatic life Paper presented to the American Society of Mechanical Engineers at New York, N Y , November 27 1962.

217 Phillips, A.M., Jr Effect of diet and water temperature on the blood phosphorus of brook trout. Progressive Fish Culturist 24(1) 22-25 1962

218. Pitt, T.K., E.T Garside, and R.L. Hepburn. Temperature selection of the carp (*Cyprinus carpio* Linn) Canadian Jour. of Zoology 34 555-557 1956

219. Powers, E.B. Influence of temperature and concentration on the toxicity of salts to fishes Ecology 1:95-112.

220. Pratt, David M. Analysis of population development in Daphnia at different temperatures. Biology Bulletin 85(2):116-140 1943

221 Price, J.W. Time-temperature relations in the incubation of the white fish, *Coregonius clupeaformis* (Mitchell) Jour of General Physiology 23 449-468 1940

222. Rao, K.P. Threshold concentrations of oxygen in water for fish at various temperatures. Dokl. Akad. SSR. 151(2):439, 1953, Jour., Water Pollution Control Federation 36(7) 795 1964.

223 Rao, K.P., and T.H. Bullock. Q_{10} as a function of size and habitat temperature in poikilotherms American Naturalist 88 33-44. 1954.

224. Raphael, Jerome,M. Prediction of temperature in rivers and reservoirs. Jour. of the Power Division. ASCE, Vol. 88, No. PO2, Proc. Paper 3200 July 1962

225. Raphael, Jerome M. Temperature phenomena and control in reservoirs. Water Temperature Influences, Effects and Control, Proceedings of the 12th Pacific Northwest Symposium on Water Pollution Research. Pacific Northwest Water Laboratory, U.S. Department of HEW 1963.

226. Reid, G.K. Ecology of inland waters and estuaries. Reinhold Publishing Corp., New York. 1961

227 Schaperclause, W. The acidity of fresh water and its relation to fish. Sitzungsker Ges Naturfarsch Freunde, Berlin 1/3:1-9. 1927

228. Smith, G.S. The fresh water algae of the United States. 2nd ed., McGraw-Hill Book Co New York, p 15 1950.

229. Smith, L.L. et al. Stream pollution aquatic life water quality criteria. First Progress Report, Aquatic Live Advi-

sory Committee of the Ohio River Valley Water Sanitation Commission, Sewage and Industrial Wastes 28(5):678-690. 1956.

230. Brown, V.M. and R A. Dalton. The acute lethal toxicity to rainbow trout of mixtures of copper, phenol, zinc and nickel. Jour. Fish. Biol. 2:211-216. 1970.

231. Stevenson, J.H., and A.A. Hulsey. Vertical distribution of dissolved oxygen and water temperatures in Lake Hamilton with special reference to suitable rainbow trout habitat. Proceedings, 15th Annual Conference on the Southeastern Assoc. Game and Fish Commission pp. 245-255, 1961; Sport Fisheries Abstracts, Vol. 8, No. 1, 1963.

232. Sumner, F.B., and P Doudoroff. Some experiments on temperature acclimatization and respiratory metabolism in fishes. Biology Bulletin 74:403-429. 1938.

233. Swartz, S.O. Review of microorganisms in water supplies. Jour., New England Water Works Association 69:217. 1955.

234. Tarzwell, C.M. Development of water quality criteria for aquatic life. Paper presented at the Oklahoma Industrial Wastes Conference, November 1961.

235. Tarzwell, Clarence M. The fish population in a small pond in North America. Trans., 5th North American Wildlife Conference, pp. 245-251. 1940.

236. Tarzwell, C.M. Water quality criteria for aquatic life. Separate from Transactions, 1956 Seminar on Biological Problems in Water Pollution, Public Health Service, U.S. Department of HEW, pp. 246-272. 1957.

237. Tarzwell, C.M. What makes fish live and die. Wastes Engineering 30:443, August 1959.

238. Tauti, M. On the influences of temperature and salinity upon the rate of development of fish eggs. Jour., Imperial Fisheries Institute, Tokyo 23:31-37. 1927.

239. Theriault, E.J The oxygen demand of polluted waters Public Health Bulletin 173, Public Health Service, U.S. Department of HEW 1927.

240. Thomas, H.A., Jr. Pollution load capacity of streams. Water and Sewage Works 95:409. 1948.

241. Thompson, R.E. Factors influencing the growth of algae in water. Canadian Engineer 82(10):24, 1944; Water Pollution Abstracts, Vol. 18, Jan. 1945

242. Trembly, F.J. Biological problems in water pollution. Effects of cooling water from steam-electric power plants on stream biota. Third Seminar: 1962, Publication No. 999-WP-25, Public Health Service, U.S. Department of HEW 1965

243. Trembley, F.J. Effects of heated industrial effluent water on aquatic life. Proceedings, 8th Annual Clean Streams Conference at Harrisburg, Pa. 1960.

244. Van Oesten, John. Factors affecting the growth rate of fish. Trans., North American Wildlife Conference, 9:177-183. 1944.

245 Viehl, K. The influence of temperature on biological changes in water and sludge with special consideration of the effect of warm water discharges on the receiving stream. Gesundheit Ing. 71(21/22):349, 1950; Sewage and Industrial Wastes 23:943, 1951: Water Pollution Abstracts 27(7):168, 1952.

246. Whipple, G.C., G.M. Fair, and M.C. Whipple. Microscopy of drinking water, 4th ed., John Wiley & Sons, Inc., New York, p. 232.

247. Wurtz, C.B. Zinc effects on fresh water mollusks. Nautilus 76(2):53-61. 1962.

248. Wurtz, C.B., and C.H. Bridges. Preliminary results from macroinvertebrate bioassays. Proceedings, Pennsylvania Academy of Science 35:51-56. 1961.

249. Wurtz, C.B., and D. Dolan. A biological method used in the evaluation of effects of thermal discharge in the Schuylkill River. Proceedings, 15th Industrial Wastes Conference at Purdue University, Lafayette, Ind., pp. 461-472. 1960.

250. Wurtz, C.B., and C.E. Renn. Water temperatures and aquatic life. EEI Publications No. 65-901, Edison Electric Institute, June 1965.

251. Young, F.N., and J.R. Zimmerman. Variations in the temperature in small aquatic situations. Ecology 37:609-611. 1956.

252. Brugs, W.A. Chronic toxicity of zinc to the fathead minnow, *Pimephales prometes promelas* Rafinesque. Trans. Amer. Fish. Soc. 93:272. 1969

253. Burke, W.D., and D.E. Ferguson Toxicities of four insecticides to resistant and susceptible mosquitofish in static and flowing solutions. Mosquito News 29:96. 1969.

254. Cairns, J., Jr. Fish bioassays reproducibility and rating. Separata da Revista de Biologia 7:1,7 1969.

255. Cairns, J., Jr., W.T. Waller, and J. C. Smrchek. Fish bioassay--contrasting constant and fluctuating input of toxicants. Separata da Revista de Biologia 7(1):75 1969.

256. Chen, C.W., and R.E. Selleck. Kinetic model of fish toxicity threshold. Jour Water Pollution Control Federation 41 R284. 1969.

257 Craigie, D.E. An effect of water hardness in the thermal resistance of the rainbow trout, *Salmo gairdnerii*, Richardson. Canadian Jour. Zool. 41:825 1963.

258. Culley, D.D., Jr., and D.E. Ferguson Patterns of insecticide resistance in the mosquitofish, *Gambusia affinis*. Jour. Fish Res. Bd. Can. 26(9):2395. 1969.

259. Dandy J W T The effects of chemical characteristics of the environment on the activity of an aquatic organism. Thesis, Univ of Toronto, Toronto, Ont., 1967. Water Poll. Abs. (Brit.) 42 1708. 1969.

260. Dorfman, D and W R Whitworth. Effects of fluctuations of lead, temperature and dissolved oxygen on the growth of brook trout Jour Fish Res. Bd. Can 25(9):2493. 1969.

261. Dyga A K., and V.I. Zolotareva. Effects of effluents from metallurgical and metal-working industries on the food (zooplankton and zoobenthos) of fishes in the rivers and reservoirs of the Dnieper Basin. Problems of Ichthyology (Eng Ed. Voprosy Ikhtiologii) (USSR), Amer Fish Soc. Translation 8:610. 1968.

262. Das, B.S., S.G Reid, J L. Betts, and K. Patrick Tetrachloro-o-benzoquinone as a component in bleached draft

chlorination effluent toxic to young salmon. Jour Fish Res. Bd. Can. 26(11):3055. 1969.

263. Dooley, T.P. Comparative effects of ABS (alkylbenzene-sulfonate) on the mosquito minnow (*Gambusia affinis*). Tex. Jour. Sci. 20(2):147. 1968.

264. Elliott, J.S. The oxygen requirements of chinook salmon. Progr. Fish-Cult. 31:67. 1969.

265. Ferguson, D.E Characteristics and significance of resistance to insecticides in fishes. Reservoir Fish. Resources Symposium, Athens, Ga., p. 531, Apr. 1967. 1968.

266. Gilderhus, P.A., B.L. Berger, and R.E. Lennon. Field trails of antimycin A as a fish toxicant. Invest. Fish. Control, Bur. Sport Fish & Wildlife 27:1. 1969.

267. Gloxhuber, C., and W.K. Fischer. Action of high concentrations of alkyl polyglycol ethers on fish. Food Cosmet Toxicol. 6(4):469. 1968.

268. Graham, R.J., and T.C. Dorris. Long term toxicity bioassay of oil refinery effluents. Water Res. (Brit.) 2:643, 1968; Chem. Abs. 70:6445.

269. Grigg, G.C. Failure of oxygen transport in a fish at low levels of ambient oxygen. Comp. Biochem. Physiol 29(3):1253, 1969; Chem. Abs. 71:36670.

270. Hashimoto, Y., and J. Fukami. Toxicity of orally and topically applied pesticide ingredients to carp Botyu Kagaku (Japan) 34(2):63, 1969; Chem. Abs. 71:90207, 1969.

271. Havelka, J., and O. Albertova. Influence of antifreeze liquids and certain aromatic compounds on lower aquatic animals and on fish. Zivocisna vyroba (Czech.) 13(7):519. 1968; Chem. Abs. 70:90588, 1969.

272. Hickey, J.J., J.A. Keith, and F.B. Coon Exploration of pesticides in a Lake Michigan ecosystem. Pestic Environ., Their Eff. Wildl. Proc., p. 141, 1965 Chem. Abs. 70:67149, 1969.

273, Hunt, E.G., and J.O. Keith. Pesticide analysis in fish and wildlife. Anal. Methods Pestic., Plant Growth Regul., Food Additives 5:147, 1967; Chem. Abs. 70:56607, 1969

274. Janicke, W., and D. Ludemann. The toxic effects on fish of effluents from an activated-sludge plant. Wasserwirtschaft (Germany) 57:291, 1967; Water Poll. Abs. (Brit.) 42:202. 1969.

275. Katz, M. The biological and ecological effects of acid mine drainage with particular emphasis to the waters of the Appalachian region. Appendix F, Impact of Mine Drainage on Recreation and Stream Ecology. A report by the Appalachian Regional Commission, Washington. D.C 1969.

276. Krishnaswami, S.K., and E.E. Kupchanko Relationship between odor of petroleum refinery wastewater and occurrence of 'oily taste-flavor' in rainbow trout, *Salmo gairdnerii*. Jour. Water Pollution Control Federation 41:R189 1969.

277. Kussat, R. H. A comparison of aquatic communities in the Bow River above and below sources of domestic and industrial wastes from the City of Calgary. Can Fish Culturist 40:3. 1969.

278. LeDuc, G. Some physiological and biochemical responses of fish to chronic poisoning by cyanide. OP-Book, Univ. Microfilms, Ann Arbor, Mich., 1969; Water Poll. Abs. (Brit.) 42:861, 1969.

279. Litvintsev, A.N. Effect of waste waters from a wood-hydrolysing factory on aquatic organisms. Biol. Nauk. 10(3):20, 1967; Biol. Abs. 50:2747, 1969; Water Poll. Abs. (Brit.) 42:1710, 1969.

280. Lloyd R., and L.I. Orr. Diuretic response by rainbow trout to sublethal concentrations of ammonia. Water Res. (Brit.) 3:335, 1969; Chem. Abs. 71:19907, 1969.

281. Lloyd, R. et al. Water quality criteria for European freshwater fish. II. Extreme pH values and inland fisheries. Water Res. (Brit.) 3:593, 1969; Chem. Abs. 71:89080.

282. Loeb, H.A. Notes on the surfacing of fish due to chemical action. N.Y. Fish and Game Jour. 15:195. 1968.

283. Lowe, C.H., D.S. Hinds, and E.A. Halpern. Experimental catastrophic selection and tolerance to low oxygen concentration in native Arizona fresh water fishes. Jour. Ecol. 48:1013, 1967; Water Poll. Abs. (Brit.) 41:1986, 1968.

284. Macek, K.J., C. Hutchinson, and O.B. Cope. Effects of temperature on the susceptibility of bluegills and rainbow trout selected pesticides. Bull. Environ. Contam. Toxicology 4(3):174, 1969; Chem. Abs. 71:69608, 1969.

285. Malacea, I. Ecological considerations on the pollution of water from toxic substances. Hydrobiologia (Romania) 8:189. 1967.

286. Marking, L.L. Toxicity of rhodamine B and fluorescein sodium to fish and their compatibility with antimycin A. Progr. Fish-Cult. 21:139 1969.

287. Marchetti, R. Relations between the surface activity, chemical composition and toxicity to aquatic life, of synthetic detergents. Pollution of Waters, Some Actual Problems, 1966; Water Poll. Abs. (Brit.) 41:2144, 1968.

288. Marking, L.L. Toxicity of methylpentynol to selected fishes. Invest. Fish Control 30:1. 1969.

289. Marking, L.L. Toxicity of quinaldine to selected fishes. Invest. Fish Control, Bur. Sport Fish & Wildlife 22:3. 1969.

290. Mizuno, T. et al. The pollution of the Ina-Gawa and the Muko-Gawa Rivers and its influence to the fauna. Japanese Jour. Limnol. 30:6. 1969.

291. Mount, D.I., and C.E Stephan. Chronic toxicity of copper to the fathead minnow (*Pimephales promelas*) in soft water. Jour. Fish. Res Bd. Can. 26.2449. 1969.

292. Magasawa, K., E. Koshimura, and H. Fukuda. LD 50 and Ed 40 (mean effective dose) values of parathion and potassium cyanide in guppies and bioassay of the compounds. Eisei Shikenjo Hokoku (Japan) 86:32, 1968; Chem. Abs. 71:100768, 1969.

293. Nicholson, H.P., A.R Grazenda, and J.I. Teasley. Water pollution by insecticides Jour. S.E. Sect. Amer. Water Works Assn. 32(1).21 Chem Abs. 70:6437, 1969.

294. Rachlin, J.W., and A. Perlmutter. Response of rainbow trout cells in culture to selected concentrations on zinc sulfate. Progr. Fish-Cult. 94. 1969.

295. Rao, T.S., S. Dutt, and K Mangaiah. Demonstration of toxic substances by using the fish, *Lebistes reticulatus*.

Pharm. Weekbl. (Netherland) 104(14):273, 1969; Chem. Abs. 71:1737, 1969.

296. Saunders, J.W. Mass mortalities and behavior of brook trout and juvenile Atlantic salmon in a stream polluted by agricultural pesticides. Jour. Fish. Res. Bd. Can. 26:695. 1969.

297. Seth, A.K. et al. Monitoring of certain toxic constituents in water supplies by fish. Environ. Health (India) 9:34, 1967; Water Poll. Abs. (Brit.) 42:1465, 1969.

298. Shabalia, A.A. Effects of cobalt chloride on physiological indices in the rainbow trout (*Salmo irideus* Gibbous). Voprosy Iktiologii 8:5. 1968.

299. Singh, S.B., S.C. Banerjee, and P.C. Chakrabarti. Response of young Chinese carp to various physicochemical factors of water. Proc. Nat. Acad. Sci. India, Sect. B., 27 (Pt. 3) p. 320, 1967; Chem. Abs. 71:99326, 1969.

300. Smith, J.W., and S.G. Grigoropoulos. Toxic effects of odorous trace organics. Jour. Amer. Water Works Assn 60:969, 1968; Water Poll. Abs. (Brit.) 42:1070, 1969.

301. Spitzer, K.W., D.E. Marvin, Jr., and A.G. Heath. Effect of temperature on the respiratory and cardiac response of the bluegill sunfish to hypoxia. Comp. Biochem. Physiol. 30(1):83, 1969; Chem. Abs. 71:47058, 1969.

302. Sprague, J.B. Avoidance reactions of rainbow trout to zinc sulphate solutions. Water Res. (Brit.) 2:367, 1968; Sport Fish. Abs. 14:10571, 1969.

303. Sprague, J.B., and D.W. McLeese. Different toxic mechanisms in Kraft pulp mill effluent for two aquatic animals. Water Res. (Brit.) 2:761, 1968; Sport Fish, Abs. 14:10607, 1969.

304. Sprague, J.B., and D.W. McLeese. Toxicity of Kraft pulp mill effluent for larval and adult lobsters, and juvenile salmon. Water Res. (Brit.) 2:753, 1968; Sport Fish. Abs. 14:10606, 1969.

305. Thomas, L.E.M. Fish and their environment. Jour. Inst. Pub. Health Engr. 67:96, 1969; Water Poll. Abs. (Brit.) 42:203, 1969.

306. Vallin, S. Toxicity of fluorine to fish. Vatten 24:51, 1968; Water Poll. Abs. (Brit.) 42:1261, 1969.

307. Wellborn, T.L., Jr The toxicity of nine therapeutic and herbicidal compounds to striped bass. Progr. Fish Cult. 31:27. 1969.

308. Whitworth, W.R., and T.H. Lane. Effects of toxicants on community metabolism in pools. Limnol. Oceanog. 14:53. 1969.

309. Wilson, R.P., R.O. Anderson, and R.A. Bloomfield. Ammonia toxicity in selected fishes. Comp. Biochem. Physiol. 28:107, 1969; Sport Fish. Abs. 14:10577, 1969.

310. Wilson, D.C., and C.E. Bond. The effect of the herbicides Diquat and dichlobenil (Casoron) on pond invertebrates, Part I. Acute toxicity. Trans. Amer. Fish. Soc. 98:438. 1969.

311. Anon. Biological problems in water pollution. Third Seminar, 1962, R.A. Taft San. Eng. Center. Pub. Health Service Publ. No. 999-WP-25. 1965.

312. Anon. Symposium on agricultural chemicals and fisheries. Bull. Japan Soc. Sci. Fish. (Japan) 31:692. 1965.

313. Alabaster, J.S., and F.S.H. Abram. Development and use of a direct method of evaluating toxicity to fish. *In:* Advances in Water Pollution Research. Proc. 2nd Intl. Conf. Water Poll. Res., Pergamon Press Ltd., London, England, 1:41.

314. Beak, T.W. Biological measurement of water pollution. Chem. Eng. Progr. 60:39, 1964; Water Poll. Abs. (Brit.) 38:875, 1965.

315. Bougis, P. Effect of copper on growth of the pluteus of the sea urchin (*Paracentrotus lividus*). Compt. Rend. Acad. Sci. (France) 260:2929, 1965; Water Poll. Abs. (Brit.) 38:1568, 1965.

316. Boyd, C.E., and D.E. Ferguson. Spectrum of cross-resistance to insecticides in the mosquito fish, *Gambusia affinis.* Mosquito News 24:19, 1964; Pub. Health Eng. Abs. 44:1958, 1964.

317. Braginskii, L.D. Use of an oxygen method to determine algicide activity. Radioaktivn. Izotopy v Gidrobiol. i Metody San. Gidrobiol., Akad. Nauk SSSR, Zool. Inst., p. 108, 1964; Chem. Abs. 62:11087. 1965.

318. Cabejszek, I., J. Luezak, J. Just, and J. Maleszewska. Influence of sulfapol-50 on physico-chemical properties and biocenosis of water. Gas. Woda i Tech. San. (Poland) 37:53, 1963; Water Poll. Abs. (Brit.) 38:1372, 1965.

319. Carter, L Effects of acidic and alkaline effluents on fish in seawater. Effl. and Water Trt. Jour. 4:484, 1964; Pub. Health Eng. Abs. 45:570, 1965.

320. Cope, O.B. Some responses of freshwater fish to herbicides. Proc. Southern Weed Conf. 18:439, 1965; Chem. Abs. 63:1168. 1965.

321. Davis, R.C. Gambusia–industrial effluent monitors. Water and Sew. Works 111:259, 1964; Pub. Health Eng. Abs. 45.181, 1965.

322. Deschiens, R., H. Floch, and T. Floch. Powdered cuprous chloride as a molluscicide not fatal to fishes. Bull. Soc. Pathol. Exotique (France) 57:377, 1964; Chem. Abs. 62:16903, 1965.

323. Dewey, J.E., and B.L. Parker. Mass rearing of *Daphnia magna* for insecticide bioassay. Jour. Econ. Entomol. 57:821, 1964; Biol. Abs. 46:31673, 1965.

324. DeWitt, J.W., Jr. Effects of pollutional conditions on stream organisms with especial emphasis on stone-fly naiads. Dissertation Abs. XXIV:3507. 1963.

325. Dimick, R.E., and W.P. Breese. Bay mussel embryo bioassay. Proc. 12th Pacific Northwest Ind. Waste Conf., Univ. of Washington, p. 165. 1965.

326. Dowden, B.F., and H.J. Bennett. Toxicity of selected chemicals to certain animals. This Journal 37(9):1308, September 1965.

327. Eisler, R. Some effects of a synthetic detergent of estuarine fishes. Trans. Amer. Fish. Soc. 94:26. 1965.

328. European Inland Fisheries Advisory Commission. Water quality criteria for European freshwater fish. Intl. Jour. Air Water Poll. 9:151. 1965.

329. Faust, S.D., and O.M. Aly. Water pollution by organic pesticides. Jour. Amer. Water Works Assn. 56:267.

330. Gaufin, A.R. et al. Toxicity of ten organic insecticides to various aquatic invertebrates. Water and Sew. Works 12:276, 1965; Chem. Abs. 63:15480, 1965.

331. Gillar, J. The effect of cyanide on some aquatic animals. Jour. Sci. Pap. Inst. Chem. Technol., Prague, Technol. Water, 6, Pt. 1, 435, 1962 (German summary); Water Poll. Abs. (Brit.) 38:334, 1965.

332. Gillespie, D.M. Some toxic effects of malathion on Daphnia. Proc. Montana Acad. Sci. 24:11, 1965: Chem. Abs. 63:10600, 1965.

333. Grau, P., and J. Hrubec. Pollution of a river by cyanide. Vodni Hospodarstvi (Czech.) 15:19, 1965; Chem. Abs. 63:5366, 1965.

334. Hendrick, R.D., and T.R. Everett. Toxicity to the Louisiana red crawfish of some pesticides used in rice culture. Jour. Econ. Entomology 58:958, 1965; Chem. Abs. 63:15475, 1965.

335. Herbert, D.W.M. Pollution and fisheries. *In*. Ecology and the Industrial Society, Fifth Symposium of the British Ecological Soc., Blackwell Scientific Publications, Oxford, England, p. 173. 1965.

336. Hoff, J.G., and J.R. Westmand. Experiments with a dibrom-malathion formulation as a selective pesticide. N.Y. Fish and Game Jour. 12:99. 1965.

337. Holden, A.V. Possible effects on fish of chemicals used in agriculture. Jour. and Proc., Inst. Sew. Purif., Part 4, 361, 1964; Chem. Abs. 62:7047, 1965.

338. Howard, T.E., and C.C. Walden. Pollution and toxicity characteristics of Kraft pulp mill effluents. Tappi 48:136. 1965; Chem. Abs. 62:12889, 1965.

339. Ikuta, K. Massive death of *Plecoglossus altivelis* caused by the waste of phenol-formaldehyde resin work. Nippon Suisan Gakkaishi (Japan) 30:601, 1964: Chem. Abs. 63:1527, 1965.

340. Immel, R., and G. Geisthardt. Bromophos, a new insecticide with low toxicity. Mededel, Landbouwhogeschool Opzoekingssta. Staat Gent (Netherlands) 29:1242. 1964.

341. Irwin, W.H. Fifty-seven species of fish in oil-refinery waste bioassay. Trans. 13th N. Amer. Wildlife and Natural Resources Conf. p. 89, March 1965.

342. Ito, T., and K. Kuwada. Aquatic communities in polluted streams with industrial and mining wastes. Ann. Rept. Noto Mar. Lab. (Japan) 4:33. 1964.

343. Jones, J.R.E. Fish and river pollution. Butterworth, Inc Washington, D.C. 1964.

344. Kaplan, H.M., and L. Yoh. Toxicity of copper for frogs. Herpetologica 17:131, 1961; Chem. Abs. 62:9508, 1965

345. Klinke, H.R. Effects of oil and tar products in water on the fish organisms. Munch. Beitr. (Germany) 9:75, 1962; Water Poll. Abs. 37:1018, 1964.

346. Kramer, R.H., and L.L. Smith, Jr. Effects of suspended wood fiber on brown and rainbow trout eggs and alevins. Trans. Amer. Fish. Soc. 94:252. 1965

347. Lane, C.E. Toxicity experiments on barnacle and brine shrimp larvae. PB 165286. Avail. CFSTI, 1963; Chem. Abs. 63:15483, 1965.

348. Lloyd, R. Factors that affect the tolerance of fish to heavy-metal poisoning. U.S. Pub. Health Service Publ. No. 999-WP-25, p. 181, 1962; Chem. Abs. 63:16845, 1965.

349. Loeb, H.A., H.H. Gettner, and H.A. Abramson. Effect of 48 derivatives of D-lysergic acid on the surfacing behavior of laboratory fish. N.Y. Fish Game Jour. 12:79. 1965.

350. Lomova, M.A. Decomposition of cellulose fibers in the biological purification process of effluents from pulp manufacture. Trudy Vses. Nauch-Issled. Inst. Tsellyul.-Bumazh. Prom. 48:82. 1962; Chem. Abs. 61:9288, 1964.

351. Ludemann, D., and H. Kayser. The toxic effect of the insecticide material S1752 (Baytex, Lebaycid) on fresh-water animals. Zeits. Angew. Zool. (Ger.) 49:447, 1962; Water Poll. Abs. (Brit.) 38:1907, 1965.

352. Luk'yanenko, V.I., and B.A.Flerov. Reversibility dynamics of phenol poisoning in carp. Mater. Biol. Gidrol. Volzh. Vodokhr., Akad. Nauk. SSSR p. 107, 1963; Water Poll. Abs. (Brit.) 38:1377, 1965.

353. Luk'yanenko, V.I., and B.A. Flerov. The effect of the seasonal factor in the resistance of fish. Voprosy Ikhtiol. (USSR) 4:178, 1964; Biol. Abs. 46:64814, 1965.

354. Mackenthun, K.M., and W.M. Ingram. Pollution and the life in water. Pub. Health Service Publ. No. 999-WP-20. 1965.

355. Malacea, I. Experimental studies on the toxic action of chromium on certain species of fish and on the crustacean *Daphnia magna*. Stud. Prot. Epur. Apel. (Romania) 4:347, 1962, French summary; Water Poll. Abs. (Brit.) 38:881, 1965.

356. Malacea, I., and E. Gruia Contributions to the study of the toxic effect of heavy metals on some aquatic organisms. Inst. Hydrotech. Res., Sci. Sess. (Romania), Sect. 4, p. 47, 1964; Water Poll. Abs. (Brit.) 38:1567, 1965.

357. Mann, K.H. Heated effluents and their effects on the invertebrate fauna of rivers. Proc. Soc. Water Trt. Exam. 14:45. 1965.

358. Mann, H., and O.J. Schmid. The sublethal effect of a detergent mixture (Tetrapropylenbenzolsulfonate) on the growth of *Lebistes reticulatus*. Arch. Fisch Wiss. (Ger.) 16:16. 1965.

359. Marchetti, R. Toxicity of some surfactants to fish. Riv. Ital. Sostanze Grasse (Italy) 41:533, 1964; Chem. Abs. 62:10895, 1965.

360. Matulova, D. The effects of detergents on water algae. Vodni Hospodarstvi (Czech.) 14:377, 1964; Chem. Abs. 62:10210, 1965.

361. Meyer, F.P. The effect of formulation differences on the toxicity of benzene hexachloride to golden shiners. Proc. 17th Ann. Conf. of the Southeastern Assn. of Game and Fish Commissioners, Hot Springs, Ark. (Sept.-Oct. 1963).

362. Minter, K.W. Standing crop and community structure of plankton in oil refinery effluent holding ponds. Thesis, Oklahoma State Univ., 1964; Water Poll. Abs. (Brit.) 38:1182, 1965.

363. Nebeker, A.V., and A.R. Gaufin. Bioassays to determine pesticide toxicity to the amphipod crustacean, *Gammarus lacustris*. Utah Acad. Sci. Proc. 41:64, 1963-64; Chem. Abs. 62:11087, 1965.

364. Nehring, D. The adverse effects of copper sulfate, zinc sulfate, calcium cyanide, ammonia, and phenol against carp (*Cyprinus carpie*) from water and following oral application. Zeits. Fisch. (Ger.) 12:717. 1964.

365. O'Connell, R.L., and N.A. Thomas. Effect of benthic algae on stream dissolved oxygen. Jour. San. Eng. Div., Proc Amer. Soc. Civil Engr. 91(SA3):1. 1965.

366. Ogilvie, D.M., and J.M. Anderson. Effect of DDT on temperature selection by young Atlantic salmon. *Salmo salar*. Jour. Fish. Res. Bd. Can. 22:503. 1965.

367. Pickering, Q.H., and W.N. Vigor. The acute toxicity of zinc to eggs and fry of the fathead minnow. Progr. Fish. Cult. 27:138, 1965; Biol Abs. 46:92244, 1965.

368. Saurig, D. The hydrobiological evaluation of water. Gas u. Wasserfach (Ger.) 104:1323, 1963; Water Poll. Abs. (Brit.) 38:1, 1965.

369. Sindelar, V., and P. Marvan. Toxicity of flotation reagents for aquatic organisms. Bergakademie (Ger.) 17:103, 1965; Chem. Abs. 63:3369, 1965.

370. Skidmore, J.F. Resistance to zinc sulphate of the zebrafish (*Brachydanio rerio* Hamilton-Buchanan) at different phases of its life history. Ann. Appl. Biol. (Brit.) 56:47. 1965.

371. Sprague, J.B., and B.A. Ramsay. Lethal levels of mixed copper-zinc solutions for juvenile salmon. Jour. Fish. Res. Bd. Can. 22:425. 1965.

372. Sprague, J.B., P.F. Elson, and R.L. Saunders. Sublethal copper-zinc pollution in a salmon river–a field and laboratory study. Intl. Jour. Air Water Poll. 9:531. 1965.

373. Svec, J. The effect of tannery waste waters on aquatic organisms. Vodni Hospodarstvi (Czech.) 9:494, 1959; Sci. Pap., Inst. Chem. Technol., Prague, Technol. Water (Czech.) 6(2):546, 1964; Water Poll. Abs. (Brit.) 38:872, 1965.

374. Swisher, R.D., J.T. O'Rourke, and H.D. Tomlinson. Fish bioassays of linear alkylate sulfonates (LAS) and intermediate biodegradation products. Jour. Amer. Oil Chem. Soc. 41:746. 1964.

375. Tabata, K. Toxicity of ammonia to aquatic animals with reference to the effect of pH and carbon dioxide. Bull. Tokai Reg. Fish. Res. Lab. (Japan) 34:67, 1962; Biol. Abs. 45:9654, 1964.

376. Tabata, K. Systematic studies on toxic components in industrial wastes with reference to the tolerance of aquatic lives–II. On acute toxic components in digested waste from ammonium-base semichemical pulp mills. Bull. Tokai Reg. Fish. Res. Lab. (Japan) 42:11 (English summary). 1965.

377. Thomas, W.B., M.J. Cohen, and T.W. Bendixen. Pesticides in soil and water, an annotated bibliography. Pub. Health Service Publ. No. 999-WP-17. 1964.

378. Vejvoda, M. The toxicity of some pesticides to fish. Pracevyzk. Ust. Ryb. Hydrobiol. Vodn. (Czech.) 4:113, 1964 (English summary); Water Poll. Abs. 38:1901, 1965.

379. Weiss, C.M. Organic pesticides and water pollution. Pub. Works 95(12):84, 1964; Pub. Health Eng. Abs. 45:994, 1965.

380. Weiss, C.M. Use of fish to detect organic insecticides in water. This Journal 37(5):647, May 1965.

381. Wilber, C.G. The biology of water toxicants in sublethal concentrations. Pub. Health Service Publ. No. 999-WP-25, 326, 1962; Chem. Abs. 63:14537, 1965.

382. Williams, L.G. Possible relationships between plankton diatom species numbers and water-quality estimates. Ecology 45:809, 1964; Biol. Abs. 46:55628. 1965.

383. Williams, L.G., and D.I. Mount. Influence of zinc on periphytic communities. Aerm. Jour. Botany, 52:26, 1965; Publ. Health Eng. Abs. 45:1200, 1965.

384. Woelke, C.E. Bioassays of pulpmill wastes with oysters. *In*. Biological Problems in Water Pollution. Trans. Third Seminar on Biological Problems in Water Pollution, Publ. Health Service, Cincinnati, Ohio, p. 67. 1965.

385. Wood, L. A controlled conditions system (CCS) for continuously flowing seawater. Limnol. Oceanog. 10:475. 1965.

386. King, D.L. An ecological and pollution-related study of a warm-water stream. Dissertation Abs. 25:4892, 1965; Biol. Abs. 46:10629, 1965.

387. Jenkins, R. Some toxic components in oil refinery effluents. Dissertation Abs. 26:1837, 1965; Chem. Abs. 63:18920, 1965.

388. Oliver, K.H., Jr. Causal factors of population variation in the algae (*Chlorella*) of a papermill waste water pond system. Dissertation Abs. 25:1425, 1964; Biol. Abs. 46:2337, 1965.

389. Reiff, B. Factors influencing the testing of chemicals and effluents for toxicity to fish. Jour. Sci. Technol. (Brit.) 10:167, 1964; Chem. Abs. 62:8819, 1965.

390. Abedi, Z.H., and D.E. Turton. Note on the response of zebra fish larvae to folpet and difolatan. Jour. Assn. Offic. Annal. Chem. 51:1108, 1968; Chem. Abs. 69:95387, 1968.

391. Ball, I.R. The relative susceptibilities of some species of fresh-water fish to poisons II. Zinc. Water Res. (Brit.) 1:777. 1967.

392. Ball, I.R. The relative susceptibilities of some species of fresh-water fish to poisons I. Ammonia. Water Res. (Brit.) 1:767. 1967.

393. Ball, I.R. The toxicity of cadmium to rainbow trout (*Salmo gairdnerii*). Water Res. (Brit.) 1:805, 1967; Chem. Abs. 68:93891, 1968.

394. Beekman's I. Toxicite' de substances presentees dans les eaux residuaies de decaperies et de traitement des meatux. La Tribuen du CEBEDEAU 21:334. 1968.

395. Benoit, J.R., J Cairns, Jr., and C.W. Reimer. A limnological reconnaissance of an impoundment receiving heavy metals, with emphasis on diatoms and fish. Proc. Reser. Fishery Resources Symposium, Amer. Fish. Soc., April 5-7, 1967; Univ. of Georgia Press, Athens, Ga., 1968.

396. Benville, P.E., Jr., C.E. Smith, and W.E. Shanks. Toxic effects of dimethyl sulfoxide in salmon and trout. Toxicol. Appl. Pharmacol. 12:156, 1968; Chem. Abs. 69:42050, 1968.

397. Bermane, S. Physiological role of trace elements in freshwater fish. Obmen Veshchestv Biokhim. Ryb. Akad. Nauk SSSR, Min. Fyb. Khoz. SSSR, Ikhitol. Kom. (USSR). p. 275, 1967; Chem. Abs. 68:112531, 1968

398. Brower, G.R. Ozonation reactions of selected pesticides for water pollution abatement. Thesis, Washington Univ., 211 p., 1967; Dissertation Abs. 28(B):722, 1967; Water Poll. Abs. (Brit.) 41:547, 1968.399.

399. Brown, V.M. The calculation of the acute toxicity of mixtures of poisons to rainbow trout. Water Res (Brit.), 2:723. 1968.

400. Brown, V.M., D.H.M. Jordan, and B.A. Tiller The effect of temperature on the acute toxicity of phenol to rainbow trout in hard water. Water Res. (Brit.) 1:587. 1967.

401. Brown, V.M., V V. Mitrovic, and G.T.C. Stark. Effects of chronic exposure to zinc on toxicity of a mixture of detergent and zinc. Water Res. (Brit.) 2:255. 1968.

402. Brown, V.M., D.G. Shurben, and J.K. Fawell. The acute toxicity of phenol to rainbow trout in saline waters. Water Res. (Brit.) 1:683. 1967.

403. Burke, W.D., and D.E. Ferguson. A simplified flow-through apparatus for maintaining fixed concentrations of toxicants in water. Trans. Amer. Fish. Soc. 97:498. 1968.

404. Cairns, J. Suspended solids standards for the protection of aquatic organisms. Proc. 22nd Ind. Waste Conf., Purdue Univ., Ext. Ser. 129, p. 16. 1967.

405. Cairns, J., Jr., and A. Scheier. A comparison of the toxicity of some common industrial waste components tested individually and combined. Progr. Fish. Cult. 30:3, 1968; Chem. Abs. 68:98450, 1968.

406. Chadwick, G.G., and U. Kiigemagi. Toxicity evaluation of a technique for introducing dieldrin into water. Jour. WPCF 40(1):76. Jan. 1968.

407. Cusick, C.J. Mucous cell response of the guppy to heavy metals and water quality. Thesis, Univ. of Cincinnati, 143 p., 1967; Dissertation Abs. 28(B):2664, 1967; Water Poll. Abs. (Brit.) 41:1946, 1968.

408. Dahlberg, M.J., D.L. Shumway, and P. Doudoroff. Influence of dissolved oxygen and carbon dioxide on swimming performance of largemouth bass and coho salmon. Jour. Fish. Res. Bd. Can. 25:49. 1968.

409. Deschiens, R. Control of the effect of chemical molluscacides on freshwater zoophytic associations. C.R. Acad. Sci., Paris, Ser. D, 266:1860, 1968; Chem. Abs. 69:42995, 1968.

410. Ferguson, D.E., and C.R. Bingham. The effects of combinations of insecticides on susceptible and resistant mosquito fish. Bull. Environ. Contam. Toxicology 1:97. 1966.

411. Flis, J. Anatomicohistopathological changes induced in carp (*Cyprinus carpio* L.) by ammonia water. Part II. Effects of subtoxic concentrations. Acta Hydrobiologia (Denmark) 10:225. 1963.

412. Frear, D.E.H., and J.E. Boyd. Use of *Daphnia magna* for the microbio assay of pesticides. Jour. Econ. Entomol. 60:1228, 1967; Water Poll. Abs. (Brit.) 41:729, 1968.

413. Garrison, R.L. The toxicity of pro-noxfish to salmonid eggs and fry. Progr. Fish Cult. 30:35, 1968; Biol. Abs. 49:51111, 1968.

414. Godsil, P.J., and W.C. Johnson. Pesticide monitoring of the aquatic biota in the Tule Lake National Wildlife Refuge. Pesticides Monitoring Jour. 1:21, 1968; Chem. Abs. 68:94869, 1968.

415. Halsband, E. Methods of physiological research for assessing the degree of injury of waste water poisons in fresh, brackish and salt water. Helgolander wiss. Meeresunters (Ger.) 17:224. 1968.

416. Hamm, A. Fish toxicity of nonionic detergents. Muenchner Beitr. Abwasser-, Fisch.-Flussbiol. (Ger.) 9:118. 1967; Chem Abs. 68:107723, 1968.

417. Hayton, W.L., and N.Q. Hall. Apparent pH dependence of ethanol absorption rate in the common guppy. Jour. Pharm. Sci. 57:158, 1968 Chem. Abs. 6847413, 1968.

418. Herbst, H.V. Experimentelle untersuchungen zur toxizitat des zinks. Gewass. Abwass (Ger.) 44:37. 1967

419. Herr, F., E Greselin, and C. Chappel. Toxicology studies of antimycin, a fish eradicant. Trans. Amer. Fish. Soc. 96:320, 1967; Biol. Abs. 49:29482, 1968.

420. Huner, J.V. The effects of endrin on the oxygen consumption of the bluegill sunfish *Lepomis macrochirus*. Proc. Louisiana Acad. Sci. 30:80, 1967; Biol. Abs. 49:89466, 1968.

421. Hueck, H.J., and Dorothea, M.M. Adema. Toxicological investigations in an artificial ecosystem. A progress report on copper toxicity towards algae and daphniae. Helgolander wiss, Meeresunters (Ger.) 17:188. 1968.

422. Hunn, J.B., R.A. Schoettger, and E.W. Whealdon. Observations on the handling and maintenance of bioassay fish. Progr. Fish. Cult. 30:164. 1968.

423. Johnels, A.G. et al. Pike (*Esox lucius* L.) and some other aquatic organisms in Sweden as indicators of mercury contamination of the environment. OIKOS 18:323, 1967; Biol. Abs. 49:92854, 1968.

424. Johnson, D.W. Pesticides and fishes–a review of selected literature. Trans. Amer. Fish. Soc. 97:398. 1968.

425. Johnson, W.C. Toxaphene treatment of Big Bear Lake, California. Calif. Fish and Game 52:173, 1966; Water Poll. Abs. (Brit.) 41:172, 1968.

426. Kariya, T., S. Eto, and S. Ogasawara. Studies on the post-mortem identification of the pollutant in fish killed by water pollution–VIII. On acute poisoning with phenol. Bull. Japan Soc. Sci. Fish. 34:764. 1968.

427. Konar, S.K. Experimental use of chlordane in fishery management. Progr. Fish. Cult. 39:96. 1968.

428. Lebedeva, G.D. Effect of stable and radioactive strontium on aquatic organisms. Gidrobiol. Zh., Akad. Nauk, Ukr. (USSR) 4:3, 1968; Chem. Abs. 69:94079, 1968.

429. Lee, J.J., and C.L. Marcellino. The effect of selected pollutants on *Allogromia laticollaris.* Jour. Protozool., p. 14, Suppl. 16, 1967; Water Poll. Abs. (Brit.) 41:1342, 1968.

430. Lewis, W.M. Isoborny thiocyanoacetate as a fish-drugging agent and selective toxin. Prog. Fish. Cult. 30:29, 1968; Chem. Abs. 68:94876, 1968.

431. Liebmann. H. The effect of new detergents on fisheries and on the process of self-purification. Abwass. Technik. (Ger.) 17(1)·VII, 1966; Water Poll. Abs. (Brit.) 41:331, 1968.

432. Lishka, R.J. Water pesticides. USPHS Publ. No. 999-WP-29. 64 p., U.S. Govt. Printing Office, Washington, D.C., 1966: Chem. Abs. 66:1850, 1967.

433. Loeb, H.A., and R.J. Starkev. Survival of buried bulheads subjected to 4'-iodo-3-nitrosalicylanilide. N.Y., Fish and Game Jour 13:196, 1966; Biol. Abs. 49:13289 1968.

434. Ludke, J.L., D.E. Ferguson. and W.D. Burke. Some endrin relationships in resistant and susceptible populations of golden shiners, *Notemigonus crysoleucas.* Trans. Amer. Fish. Soc. 97:260. 1968.

435. Ludwig, P.D. et al. Biological effects and persistance of dursban insecticide in a salt-marsh habitat. Jour. Econ Entomol. 61 626, 1968; Chem. Abs. 69:34943, 1968.

436. Malacea, I. Contributions to knowledge on the toxic effect of cyanides, ammonia, mercury and arsenic on some species of fish and on Daphnia. Studii Prot. Epur. Apel, Buc 7:751, 1966: Water Poll. Abs. (Brit) 40:1939. 1967

437. Malacea, I. Contribution to the study of the toxic action of the insecticides detox and heclotox on certain specis of fish and on Daphnia. Studii Prot. pur. Apel., Buc. 8:95, 1967; Water Poll. Abs. (Brit.) 41:1944, 1968.

438 Mann, H., Effect of sublethal doses of detergents on fish. Muenchner Beitr. Abwasser-. Fisch.-Flussbiol. (Ger.) 9:131, 1967; Chem. Abs. 68:107734. 1968.

439. Marchetti, R. Sublethal effects of surfactants on fish. Riv. Ital. Sostanze Grasse (Italy) 45:27. 1968; Chem. Abs. 69:17203, 1968.

440. Marking, L.L., and J.W. Hogan Toxicity of Bayer 73 to fish. Invest. Fish Contr. (Brit.) 19:13, 1967; Chem. Abs 68:2251 1968

441. Meeks, R.L. The accumulation of Cl ring labeled DDT in a freshwater marsh. Jour. Wildlife Management 32:376. 1968.

442. Mitrovic, V.V., V.M. Brown, D.G. Shurben, and M.H. Berryman. Some pathological effects of sub-acute and acute poisoning of rainbow trout by phenol in hard water. Water Res. (Brit.) 2:249. 1968

443. Mount, D.F Chronic toxicity of copper to fathead minnows (*Pimephales promelas,* Rafinesque). Water Res. (Brit.) 2:215. 1968.

444. Nekipelov, M.I Nitrates in industrial sewage and their effect upon aquatic organisms Byull. mosk. Obshch. Ispyt. Prir., Otd. Biol. p. 71, 1966; Chem. Abs. 66:6488, 1967; Water Poll. Abs. (Brit.) 40:1937, 1967.

445. Nishiuchi, Y., and Y. Hashimoto. Toxicity of pesticides to some freshwater fleas and fish. Bochu Kagaku (Japan) 32:5, 1967; Chem. Abs 68:38464, 1968.

44 O'Brien, R.D. Insecticides–action and metabolism. Academic Press, New York, N.Y. 1967. 332. p.

44 O'Neal, G.L. The degradation of Kraft pulping wastes in estuarine waters. Thesis, Oregon State Univ., 134 p., 1966; Dissertation Abs. 27(B):2735, 1967, Water Poll. Abs. (Brit.) 41:334, 1968.

448 Patrick. R., J. Cairns, Jr., and A. Schier. The relative sensitivity of diatoms, snails, and fish to twenty common constituents of industrial wastes. Progr Fish. Cult. 30:137. 1968.

449 Pickering, Q.H. Some effects of dissolved oxygen concentrations upon the toxicity of zinc to the bluegill, *Lepomis macrochirus.* Water Res. (Brit.) 2:187. 1968: Chem Abs. 69·1481, 1968.

450. Regier, H.A., and W.H. Swallow. An aquarium temperature control system for field stations. Progr. Fish. Cult. 30:43. 1968.

451 Rothschein. J. Some critical considerations on the theme 'toxicological experiments and maximal permissible concentrations of toxic substances in water.' Sbornik Vysoke Skoly Chem. Tech. Praze. Tech. Vody (Czech.) 8:303, 1964; Water Poll. Abs. (Brit.) 41:309, 1968.

452. Schaumburg, F.D., T.E. Howard. and C.C. Walden. A method to evaluate the effects of water pollutants on fish respiration. Water Res. (Brit.) 1:731 1967; Chem. Abs. 68 53097. 1968.

453. Servizi J.A., R.W. Gordon, and D.W. Martens. Toxicity of two chlorinated catechols, possible components of Kraft pulp mill bleach waste. Int. Pac Salmon Fish. Comm. Progr Rep. 17:1, 1968 Biol. Abs. 49:103626. 1968.

454. Solon, J.M., J.L. Lincer. and John H. Nair, III. A continuous flow, automatic device for short-term toxicity experiments Trans. Amer. Fish. Soc 97:501 1968.

455. Stapleton, R.P. Trace elements in tissues of the calico bass *Paralabrax clathratus.* Bull. S. Calif. Acad. Sci , 67(1):49, 1968; Chem Abs 69 33818, 1968

456. Stroganov, N.S. Fish metabolism. Obmen Veshchestv Biokhim. Ryb. Akad. Naul SSSR, Min Ryb. Khoz. SSSR, Ikhtiol. Kom. p. 23-30, 1967 Chem Abs 69·1038. 1968.

457 Tokunaga, S., and I. Tani. Bioassay of chemical poisons. II. Characteristics of brine shrimp. *Artemia slina.* Kagaku Keisatsu Kenyusho Hokoku (Japan) 20·168. 1967; Chem. Abs. 69:65809, 1968.

458. Toth. S.J. Metallic elements in inland waterways. Jour. Amer. Water Works Assn. 60:455. 1968; Chem. Abs. 69:30020, 1968.

459. Tsai, Chu-Fa Effects of chlorinated sewage effluents on fishes in Upper Patuxent River, Maryland. Chesapeake Sci. 9:83. 1968

460. Veger, J. Toxic effect of insecticide organophosphates upon aquatic organisms. Vodni Hospodarstivi (Czech.) 18 19 1968: Chem. Abs. 69:2081 1968.

461. Voloshchenko, O.I. Hygienic and toxicological estimation of small amounts of aldrin as a factor in the contamination of inland waters. Problems of Commun al Hygiene. Zdorov' 'ya: Kiev. 6:99, 1966; From. Ref. Zh Otd Vyp Farmakol Khimoiter Sredstva Toksikol (USSR) 54:1055, 1968; Biol. Abs 49·119948, 1968.

462. Warnick, S.L. Pesticides in the aquatic environment as determined by gas chromatography. Univ. Microfilms (Ann Arbor, Mich.), Order No. 66-9841, 124 p., 1966; Dissertation Abs. B(27):1336, 1966; Chem. Abs. 66:36760, 1967.

463. Wedemeyer, G. Uptake and distribution of zinc-65 in the coho salmon egg (*Oncorhynchus kisutch*). Comp. Biochem. Physiol. 26:271, 1968; Chem. Abs. 69:42014, 1968.

464. Whitworth, W.R. Effects of diurnal fluctuations of dissolved oxygen on the growth of brook trout. Jour. Fish. Res. Bd. Can. 25:579, 1968; Biol. Abs. 49:71031, 1968.

465. Willford, W.A. Toxicity of 22 therapeutic compounds to six fish. Invest. Fish. Contr. (Brit.) 18:10, 1967; Chem. Abs. 68:1958, 1968.

466. Willford, W.A. Toxicity of dimethyl sulfoxide (DMSO) to fish. Invest. Fish. Contr. (Brit.) 20:8. 1967; Chem. Abs. 68:1702, 1968.

467. Williams, L.G., J.F. Kopp, and C.M. Tarzwell. Effects of hydrographic changes on contaminants in the Ohio River. Jour. Amer. Water Works Assn. 58:333, 1966; Chem. Abs. 68:6014, 1968.

468. Wisely, B., R.A.P. Blic. Mortality of marine invertebrate larvae in mercury, copper, and zinc solutions. Australian Jour. Mar. Freshwater Res. 18:63, 1967; Chem. Abs. 68:1165, 1968.

469. Abram, F.S.H. The definition and measurement of fish toxicity thresholds. *In:* Advances in Water Pollution Research. Proc. 3rd Intl. Conf. Water Poll. Res., Water Pollution Control Federation, Washington, D.C. 1:75, 1967; Water Poll. Abs. (Brit.) 40:1375, 1967.

470. Ball, I.R. Toxicity of dimethyl sulphoxide to the goldfish, *Carassius auratus.* Nature (Brit.) 210:639. 1966.

471. Beger, H. Guide to the biology of domestic and industrial water supplies. 2nd Edition. Gustav Fischer Verlag, Stuttgart, 366 p., 1966; Water Poll. Abs. (Brit.) 40:743, 1967.

472. Berglund, F., and A. Wretlind. Toxicologi levels of mercury in Swedish fish. Var Foda (Sweden) 19:9, 1967; Chem. Abs. 66:93561, 1967.

473. Betts, J.L., T.W. Beak, and G.G. Wilson. A procedure for small-scale laboratory bioassays. This Journal 39(1):89. Jan. 1967.

474. Bohmont, B.L. Toxicity of herbicides to livestock, fish, honey bees, and wildlife. Proc. West. Weed Control Conf. 21:25, 1967; Chem. Abs. 67:81337, 1967

475. Bonn, E.W. and B.J. Follis. Effects of hydrogen sulfide on channel catfish (*Ictalurus punctatus*). Proc. 20th Ann. Conf. Southeastern Assoc. Game and Fish Comm., Asheville, N.C., p. 424. 1966.

476. Breitig, G. Zur notwendigkeit der standardisierung von toxizitatstesten. Verh, Intl. Ver. Limnol. (Ger.) 16:979. 1966.

477. Brungs, W.A., and G.W. Bailey. Influence of suspended solids on the acute toxicity of endrin to fathead minnows. Proc. 21st Ind. Waste Conf., Purdue Univ., Ext. Ser 121:4. 1966.

478. Brungs, W.A., and D.I. Mount. Lethal endrin concentration in the blood of gizzard shad. Jour. Fish. Res. Bd. Can. (Canada) 24:429, 1967; Pub. Health Eng. Abs. 47:1765, 1967.

479. Burdick, G.E. Use of bioassays in determining levels of toxic wastes harmful to aquatic organisms. Trans. Amer. Fish. Soc., Special Publ. No. 4. 1967.

480. Cabejczek, I., J. Luczak, J Maleszewska, and J. Stanislawska. Effect of insecticides (aldrin and methoxychlor) on physical-chemical properties of water and water organisms. Intl. Ver. Theor. Angew. Limnol. Verh. (Ger.) 16:963, 1965; Chem. Abs. 67:90030, 1967.

481. Cairns, J., Jr. Don't be half-safe. The current revolution in bioassay techniques. Proc. 21st Ind. Waste Conf., Purdue Univ., Ext. Ser. 121:559. 1966.

482. Cairns, J., Jr., N.R. Foster, and J.J. Loos. Effects of sub-lethal concentrations of dieldrin on laboratory populations of guppies, *Poecilia reticulata* Peters. Proc. Acad. Natural Sci., Phila. 119:75. 1967.

483. Calderon, E.G., R.S. Royuela, and T.G. Ayuso. Introduction to the study of the harmful effects of different chemical substances on the aquatic fauna of Spanish Rivers. Ann. Inst. for Invest. Exp. 37:239, 1965; Water Poll. Abs. (Brit.) 39:2009, 1966.

484. Chavin, W. Sensitivity of fish to environmental alterations. Publ. Great Lakes Res. Div., 11:54, 1964; Water Poll. Abs. 50:1231, 1967.

485. Cope, O.B. Contamination of the freshwater ecosystem by pesticides. Jour. Appl. Ecol. (Brit.) 3:33. 1966.

486. Costa, H.H. Responses of freshwater animals to sodium cyanide solutions. Ceylon Jour. Sci., Biol. Sci. (Ceylon) 5(2):41, 1965; Water Poll. Abs. 40:1232, 1967.

487. Coulon, J. Bioassay of insecticide residues using crustacea, insects and fish. Ghent. Fijkstac. Landbowweteusch. Meded. 31:474. 1966.

488. DeWilde, M.A., and A.H. Houston. Hematological aspects of the thermoacclimatory process in the rainbow trout, *Salmo gairdneri.* Jour. Fish. Res. Bd. Can. (Canada) 24:2267, 1967; Chem. Abs. 67:114685, 1967.

489. Donaszy, E. Investigations into the toxic effect of waste waters. Hydrol. Kozl. 46:427, 1966; Water Poll. Abs. (Brit.) 40:1571, 1967.

490. Edeline, F. Resistance of fish to de-oxygenation. Cebedeau's "Oxystat." Trib. Cebedeau 17:74, 1964; Water Poll. Abs. (Brit.) 40:30, 1967

491. Engineering-Science, Inc. USPHS, Div. of Water Supply and Poll. Control. Toxicant-induced behavioral and histological pathology. A quantitative study of sublethal toxication the aquatic environment. Final report, project year 1962-63. 128 p., 1964; Water Poll. Abs. (Brit.) 39:2011, 1966.

492. Flerov, B.A., and V.I. Luk'yanenko. The role of environmental factors in resistance of fish to phenol. Tr., Inst. Biol. Vnutr. Vod, Akad. Nauk SSSR (USSR) 10:319, 1966; Chem. Abs. 66:83492, 1967.

493. Ganning, B. A chamber for offering alternative conditions to small motile aquatic animals. Ophelia 3, 1966; Pub. Health Eng., Abs. 47·1479, 1967

494. Grande, M. Effect of copper and zinc on salmonid fishes. *In:* Advances in Water Pollution Research. Proc. 3rd Intl. Conf. on Water Poll. Res., Water Pollution Control Federation, Washington, D.C. 1:97, 1967; Water Poll. Abs. (Brit.) 40:1376, 1967.

495. Hawksley, R.A. Advanced water pollution analysis by a water laboratory. Analyzer 8:13, 1967; Chem. Abs. 67:46990, 1967.

496. Heath, A.G., and A.W Pritchard. Effects of severe hypoxia on carbohydrate energy stores and metabolism in two species of fresh-water fish. Physiol. Zool. 38:325, 1965; Biol. Abs. 47:76068, 1966.

497. Hemens, J. The toxicity of ammonia solutions to the mosquito fish (*Gambusia affinis* Baird & Girard). Jour. and Proc., Inst. Sew. Purif. (Brit.) 3:265, 1966; Water Poll. Abs. (Brit.) 40:1049, 1967.

498. Hiltibran, R.C. Effects of some herbicides on fertilized fish eggs and fry. Trans. Amer. Fish. Soc. 96:414. 1967

499. Hoff, J., M.E. Chittenden. and J.R. Westman. Oxygen requirements of some marine and anadromous fishes with particular reference to problems of measurement. Proc. 21st Ind. Waste Conf., Purdue Univ., Ext Ser. 121 125. 1966.

500. Ilzina, A. Seasonal variations in trace elements (copper. manganese, iron. and zinc) in the organs and tissues of the roach from Lakes Burtnieki and Rushonu. Uchenye Zapiski Molotov. Gosudarst. Univ. im A.M. Gor'kogo (USSR) 67:45, 1965; Chem. Abs 66 73615. 1967.

501. Ingram, W.M., and K.M. Mackenthun. The pollution environment. Proc. 2nd Annual American Water Resources Conf., Urbana, Ill. 1966.

502. Jackson, H.W., and W.A. Brungs, Jr. Biomonitoring of industrial effluents. Proc. 21st Ind. Waste Conf., Purdue Univ., Ext. Ser. 121:117 1966

503. Jankowsky, H.D The effect of adaptation temperature on the metabolic level of the eel *Anguilla vulgaris* L. Helgolander Wiss Meeresunters 13:402 1966; Biol Abs. 48:70003. 1967.

504. Kennedy, V.S., and J.A. Mihursky Bibliography on the effects of temperature in the aquatic environment Univ. of Maryland. Natural Resources Institute. Contr. No 326. 89 p. (Mimeo) 1967

505. Keup. L.E., W.M. Ingram, and K.M. Mackenthun. Biology of water pollution. Federal Water Poll. Control Admin., Cincinnati. Ohio. CWA-3. 1967. 290 p.

506. Kimura, S., and Y Matida. Study on the toxicity of agricultural control chemicals in relation to fresh water fisheries management. No. 4. General summary of the studies on the toxicity of agricultural control chemicals for freshwater fishes by means of the bioassay method. Bull. Freshwater Fisheries Research Laboratory (Japan) 16 1 1966.

507. Lange. E. Effect of zinc on the phagocyte reaction of leukocytes in fish blood. Uch. Zp. Latv. Gos. Univ. (USSR) 67:59, 1965: Chem. Abs. 66 53277, 1967.

508. Lennon, R E Selected strains of fish as bioassay animals Progr. Fish. Cult. 29:129. 1967

509. Luk'yanenko, V.I., and B.A. Flerov Comparative investigation of the resistance to phenol of two different age groups of *Salmo irideus.* Tr., Inst. Biol. Vnutr Vod. Akad. Nauk SSSR (USSR) 10:295, 1966; Chem. Abs. 66:83489, 1967.

510. Mackenthun, K.M. Biological techniques in the characterization of water quality. *In:* Proceedings of the National Symposium on Quality Standards for Natural Waters. Univ. of Mich., Cont. Ed. Series 161, Ann Arbor. Mich., pp. 225-290. 1967.

511. Malacea, I. Ecological considerations on water polluted by toxic substances. Hydrobiologia (Denmark) 8:189, 1967: Chem. Abs. 67:1-02578. 1967.

512 Mann. H. The importance of physical and chemical properties of water in relation to the evaluation of fish mortality. Fischwirt (Ger.) 13:313, 1963; Water Poll. Abs. (Brit.) 40:149, 1967.

513. Marasas, W.F.O., E.B. Smalley, P.E. Degurse, J.R. Bamburg, and R.E. Nichols. Acute toxicity to rainbow trout (*Salmo gairdnerii*) of a metabolite produced by the fungus *Fusarium tricinctum.* Nature (Brit.) 214:817. 1967; Chem. Abs. 67:41366, 1967.

514 Mihursky, J.A., and V.S. Kennedy Water temperature criteria to protect aquatic life. Trans. Amer. Fish. Soc., Spec. Publ. No. 4. 1967.

515. Mills, H.B., W.C. Starrett, and F.C. Bellrose. Man's effect on the fish and wildlife of the Illinois River. Illinois Natural History Survey Biol. Notes 57:1. 1966; Biol. Abs. 48:10979. 1967.

516. Mount, D.E., and W.A. Brungs. A simplified dosing apparatus for fish toxicology studies. Water Res. 1:21, 1967; Sport Fish. Abs. 11:9020, 1966.

517 Mount, D.E., and C.E. Stephan. A method for detecting cadmium poisoning in fish. Jour. Wildlife Management 31.168. 1967

518 Mount. D.E and C.E. Stephan. A method for establishing acceptable toxicant limits for fish—malathion and the butoxyethanol ester, 2,4-D. Trans. Amer. Fish. Soc. 96:185. 1967.

519 Murphy S.D. Live metabolism and toxicity of thiophosphate insecticides in mammalian, avian, and piscine species. Proc. Soc. Exp. Biol. Med. 123:392, 1966; Pub. Health Eng. Abs. 47:380, 1967.

520 Nehrkorn. A. Statistical relations between biological and chemical investigations in receiving waters. Gesundheitsingenieur (Ger.) 88:56, 1967; Water Poll. Abs. 40:1072, 1967

521 Nicholson. H.P. Pesticide pollution control. Science 158:871. 1967.

522. Penaz. M. The influence of ammonia on eggs and young of *Salmo trutta* M. Fario Zool. Listy. 14:47, 1965; Biol. Abs. 48.31990 1967.

523 Pickering, Q.H., and C. Henderson The acute toxicity of some pesticides to fish. Ohio Jour. Sci. 66 508. 1966.

524 Rabinowitz, J.L., and R.M. Myerson Exposure of trophical fish to dimethylsulfoxide (DMSO) with special reference to toxicity and effects on the uptake of radioactive dyes.

Proc. Soc. Exp. Biol. Med. 121:1065, 1966; Biol. Abs. 47:107230, 1966.

525. Rao, T.S., S. Dutt, and K. Mangaiah. TL_m values of some modern pesticides to the fresh-water fish, *Puntius puckelli.* Environ. Health (India) 9:103, 1967; Chem. Abs. 67:107613, 1967.

526. Reichenbach-Klinke, H.H. Studies regarding the effect of ammonia upon fish. Arch. Fisch Wiss. (Ger.) 17:122. 1967.

527. Reid, G.K. Oxygen depletion in Florida lake. Quart. Jour. Fla. Acad. Sci. 27:120, 1964; Biol. Abs. 47:3453, 1966.

528. Rothschein, J. The graphical illustration of results in the biological evaluation of water quality. Veda Vyzk. Prax. (Czech.) 9:1, 1962; Water Poll. Abs. (Brit.) 40:382, 1967

529. Ryzhkov, K.P. Ecological and physiological bases for the determination of optimal conditions for the cultivation of sevan trout. *In:* Teoreticheskie osnovy rybvodstva. (Theoretical bases of fish culture) Nauka: Moscow, p. 230, 1965; Biol. Abs. 48:16233, 1967.

530. Schofield, C.L. Water quality in relation to survival of brook trout, *Salvelinus fontinalis* (Mitchill). Trans. Amer. Fish. Soc. 94:227, 1965; Water Poll. Abs. (Brit.) 39:2013, 1966.

531. Shablina, A.A Effect of cobalt chloride on the development and growth of rainbow trout (*Salmo irideus*). Izv Gos. Nauch-Issled Inst. Ozern Rechnogo Rybn Khoz. (USSR) 58:139, 1964; Biol. Abs. 48:26907, 1967.

532. Sparr, B.I., W.G. Appleby, D.M. DeVries, J.V. Osmun, J.M. McBride, and G.L. Foster. Insecticide residues in waterways from agricultural use. Adv. Chem. Ser No 60:146, 1966; Chem. Abs. 66:45733, 1967.

533. Strawn, K., and J.E. Dunn. Resistance of Texas salt and freshwater-marsh fishes to heat death at various salinities Tex. Jour. Sci. 19:57, 1967; Biol. Abs. 48:68372, 1967

534. Strel'tsova, S.V. Adaptation of carp and rainbow trout to various concentrations of dissolved oxygen. Izv. Gos. Nauch-Issled Inst. Ozern Rechnogo Rybn Khoz. (USSR) 58:17, 1964; Biol. Abs. 48:672, 1967.

535. Stroud, R.H. Water quality criteria to protect aquatic life: a summary. Trans. Amer. Fish. Soc., Special Publ. No. 4. 1967.

536. Surber, E.W. Water quality criteria for freshwater fishes. Proc. 16th Ann. Conf. Southeastern Assoc. Game and Fish Comm., p. 435, 1962; Sport Fish. Abs. 12:9343, 1967.

537. Tatarko, K.I. Effect of temperature on the early stages of postembryonic development of pond carp. Gidrobiol. Zh. 2:53, 1966; Biol. Abs. 48:47529, 1967.

538. Thatcher, T.O., and J.G. Santner. Acute toxicity of LAS to various fish species. Proc. 21st Ind. Waste Conf., Purdue Univ. Ext Ser., 121:996, 1966; Chem. Abs. 67:57103, 1967.

539. Veger, J. Toxic effect of three organophosphate insecticides on the females of *Lebistes reticulatus.* Vestn. Cesk Spolecnosti Zool. (Ger.) 31:88, 1967; Chem. Abs. 67:31896, 1967.

540. Velsen, F.J.P., and D.F. Alderdice. Toxicities of two insecticides to young coho salmon. Jour. Fish. Res. Bd. Can. (Canada) 24:1173. 1967.

541. Volodin, V.M., V.I. Luk'yanenko, and B.A. Flerov. Comparative characteristic of fish resistance to phenol in early stages of development. Tr., Inst. Biol. Vnutr. Vod. Akad. Nauk SSSR (USSR) 10:300, 1966; Chem. Abs. 66:83490, 1967.

542. Weber, E. Action of sodium nitrite ($NaNO_2$) on the guppy (*Lebistes reticulatus*). Z. Angew. Zool. (Ger.) 53:123, 1966; Chem. Abs. 66:53298, 1967.

543. Westoo, G. Mercury in fish. Var Foda (Sweden) 19:1, 1967; Chem. Abs. 66:102796, 1967.

544. Wurtz, C.B. Water use for aquatic life. Amer. Soc. Test. Mater., Spec. Tech. Publ. 416:81, 1967; Chem. Abs. 67:102590, 1967.

545. Hooper, F.F., and R.C. Ball. Bacterial transport of phosphorus in a stream ecosystem. Proc. Intl. Atomic Agency, p. 535. 1966.

546. Alabaster, J.S. Survival of fish in 164 herbicides, insecticides, fungicides, wetting agents, and miscellaneous substances. Int. Pest. Contr. 11(2):29, 1969; Chem. Abs. 71:29549, 1969.

547. Amend, D.F., W.T. Yasutake, and R. Morgan. Some factors influencing susceptibility of rainbow trout to the acute toxicity of an ethyl mercury phosphate formulation (Timsan). Trans. Amer. Fish. Soc. 98:419. 1969.

548. Anderson, J.M. Effect of sublethal DDT on the lateral line of brook trout *Salvelinus fontinalis.* Jour. Fish. Res. Bd. Can. 25:2677. 1968.

549. Armstrong, N.E., E.F. Gloyna, and B.J. Copeland. Ecological aspects of stream pollution. Water Resour. Symp. 1:83, 1968; Chem. Abs. 70:31475, 1969.

550. Asano, S., S. Nagasawa, and S. Fushimi. Biological trials of chemicals on fish. VI. Relation between temperature and the toxicity of pentachlorophenol (PCP) to carp. Botyu Kagaku 34(1):13, 1969; Chem. Abs. 71:48619, 1969.

551. Ban, T. Toxicological studies on water-soluble kyanizer. Effect of a kyanizer mixed with sodium fluoride and dinitro-o-cresol sodium salt. Yokohama Igaku 19:4, 1968; Chem. Abs. 70:95735, 1969.

552. Bauer, D.H., D.J. Lee, and R.O. Sinnhuber. Acute toxicity of aflatoxins B_1 and G_1 in the rainbow trout (*Salmo gairdnerii*). Toxicol. Appl. Pharmacol. 15(2):415, 1969; Chem. Abs. 71:89662, 1969.

553. Bender, M.E. The effect of malathion on fishes. Thesis, Rutgers State Univ., New Brunswick, N.J., 1968; Dissertation Abs. 29(B):2236; Water Poll. Abs. (Brit.) 42:1477, 1969.

554. Berger, B.L. R.E. Lennon, and J.W. Hogan. Laboratory studies on antimycin A as a fish toxicant. Invest. Fish Control, Bur. Sport Fish & Wildlife 26:1. 1969.

555. Alabaster, J.S. The survival of salmon (*Salmo salar* L.) and sea trout (*S. trutta* L.) in fresh and saline water at high temperatures. Water Res. 1:717. 1967.

556. Allen, S.D., and T.D. Brock. Adaptation of heterotrophic microcosms to different temperatures. Ecology 49:343. 1968.

557. Alderdice, D.F., and C.R Forrester. Some effects of salinity and temperature on early development and survival

of the English sole (*Parophrys vetulus*). Jour. Fish, Res. Bd. Can. 25:495. 1968.

558. Anderson, J.W., and D.J. Reish. The effects of varied dissolved oxygen concentrations and temperature on the wood-boring isopod genus *Limnoria*. Marine Biol. (W. Ger.) 1:56. 1967.

559. Ansell, A.D. The rate of growth of the hard clam *Mercenaria mercenaria* L. throughout the geographical range. J. Conseil, Conseil Perm. Intern Exploration Mer. (Denmark) 31:364. 1968.

560. Aston, R.J. The effect of temperature on the life cycle, growth and fecundity of *Branchiura sowerbyi* (Oligochaeta: Tubificidae). Jour. Zool. (Brit.) 154:29. 1968.

561. Battelle-Northwest. Biological effects of thermal discharges: annual progress report for 1967. Reprinted from USAEC Res. and Div. Rept. BNWL-714, Richland, Wash. 1968.

562. Biever, K.D. Biological studies on chironomids with emphasis on the temperature relations of the developmental stages. Dissertation Abs. 28B:4342-B. 1968.

563. Brock, T.D., and M.L. Brock. Measurement of steady-state growth rates of a thermophilic alga directly in nature. Jour. Bacteriol. 95:811. 1968.

564. Brown, V.M., D.H.M. Jordan, and B.A. Tiller. The effect of temperature on the acute toxicity of phenol to rainbow trout in hard water. Water Res. 1:587. 1967

565. Cairns, J., Jr. We're in hot water. Sci. and Cities 10:187. 1968.

566. Carlisle, D.B., and J.L. Cloudsley-Thompson. Respiratory function and thermal acclimation in tropical invertebrates. Nature (Brit.) 218:684. 1968.

567. Carpenter, W.L., J.G. Vamvakias, and I. Gellman. Temperature relationships in aerobic treatment and disposal of pulp and paper wastes. This Journal 40(5):733. May 1968.

568. Courant, C.C. Thermal pollution–biological effects. This Journal 40(6):1047. June 1968.

569. Drury, D.E., and J.G. Eales. The influence of temperature on histological and radiochemical measurements of thyroid activity in the eastern brook trout *Salvelinus fontinalis* Mitchell. Can. Jour. Zool. 46:1. 1968.

570. Duke, M.E.L. A production study of a thermal spring. Dissertation Abs. 28B:4016-B. 1968.

571 Eberly, W.R. Problems in the laboratory culture of planktonic blue-green algae. *In:* Environmental requirements of blue-green algae. U.S. Fed. Water Poll. Control Adm., Corvallis, Oreg. p. 7. 1967.

572 Engel, D.W., and J.W. Angelovic. The influence of salinity and temperature upon the respiration of brine shrimp nauplii. Comp. Bio-chem. Physiol. (Brit.) 26:749. 1968.

573. Farrell, J., and A. Rose. Temperature effects of microorganisms. Annual Rev. Microbiol. 21:101. 1967.

574. Frost, W.E., and E. Kipling. Experiments on the effect of temperature on the growth of young pike, *Esox lucius* L. Salmon and Trout Mag. 184:170. 1968.

575. Fukusho, K. The specific difference of temperature responses among cichlid fishes genus *Tilapia*. Bull. Japan Soc. Sci. Fish. 34:103. 1968.

576. Gammon, J.R. Aquatic life survey of the Wabash River, with special reference to the effects of thermal effluents on biotic populations. De Pauw University. 1968. 56 p.

577. Garside, E.T., and C.M. Jordan. Upper lethal temperatures at various levels of salinity in the euryhaline cyprinodontids *Fundulus heteroclitus* and *after isosmotic acclimation.* Jour. Fish. Res. Bd. Can. 25:2717. 1968.

578. Heath, W.G. Ecological significance of temperature tolerance in Gulf of California shore fishes. Jour. Arizona Acad. Sci. 4:172. 1967.

579. Holm-Hansen, O. Ecology, physiology, and biochemistry of blue-green algae. Annual Rev. Microbiol. 22:47. 1968.

580. Keast, A. Feeding of some great lakes fishes at low temperatures. Jour. Fish. Res. Bd. Can. 25:1199. 1968.

581 Kelley, J.W. Effects of incubation temperature on survival of largemouth bass eggs. Prog. Fish. Cult. 30:159. 1968.

582. Kendall, A.W., Jr., and F.J. Schwartz Lethal temperature and salinity tolerances of the white catfish, *Ictalurus catus,* from the Patuxent River, Maryland. Chesapeake Sci. 9:103. 1968.

583. Lewis, R.M., and W.F. Hettler, Jr. Effect of temperature and salinity on the survival of young Atlantic menhaden, *Brevoortia tyrannus.* Trans. Amer. Fish. Soc. 97:344. 1968.

584. Lutz, P.E. Effects of temperature and photoperiod on larval development in *Lestes eurinus* (Odonata: Lestidae). Ecology 49:637. 1968.

585. McIntire, C.D. Physiological-ecological studies of benthic algae in laboratory streams. This Journal 40(11):1939. Nov. 1968.

586. McLeese, D.W. Temperature resistance of the spider crab *Chionoectes opilio.* Jour. Fish. Res. Bd. Can. 25.1733. 1968.

587. Moreira, G.S., and W.B. Vernberg. Comparative thermal metabolic patterns in *Euterpina acutifrons* dimorphic males. Marine Biol. (W. Ger.) 1:282. 1968.

588. Nebeker, A.V., and A.E. Lemke. Preliminary studies on the tolerance of aquatic insects to heated waters. Jour. Kansas Entomol. Soc. 41:413. 1968.

589. Newell, R. C., and V.I. Pye. Seasonal variations in the effect of temperature on the respiration of certain intertidal algae. Jour. Mar Biol. Assn. U.K. 48:341. 1968.

590. Nicum, J.G. Some effects of sudden temperature changes upon selected species of freshwater fishes. Dissertation Abs. 27(B):3344 1967.

591. O'Hara, J. The influence of weight and temperature on the metabolic rate of sunfish. Ecology 49:159. 1968.

592. Pearson, W.D., and D.R. Franklin. Some factors affecting drift rates of baetis and simuliidae in a large river. Ecology 49:75. 1968.

593. Sandison, E.E. Respiratory response to temperature and temperature tolerance of some intertidal gastropods. Jour. Exp. Marine Biol. Ecol. (Neth.) 1:271. 1968.

594. Shields, R.J., and W.M. Tidd. Effect of temperature on the development of larval and transformed females of *Lernaea cyprinacea* L. (Lernaeidae). Crustaceana, Suppl. 1:87 1968.

595. Smirnora, G.P. The effect of food quality on the thermostability of *Xiphophorus helleri*. Rept. Summ. All-Union Conf. on the Ecology and Physiology of Fishes (USSR). p 114, 1966; Sport Fish. Abs. 13:9969, 1968.

596. Strawn, K., and J.E. Dunn. Resistance of Texas salt- and freshwater-marsh fishes to heat death at various salinities. Texas Jour. Sci. 19:57. 1967.

597. Tat'yankin, Yu. V. Upper temperature threshold of cod and pollack fry and its dependence on the adaptation temperature Dokl. Acad. Nauk. SSSR (USSR) 167:1159, 1966; Sport Fish. Abs. 13:9967, 1968.

598. United States Federal Water Pollution Control Administration. Report of the Committee on Water Quality Criteria U.S. Government Printing Office, Wash., D.C. 1968.

599. United States Senate. Hearings before the Subcommittee on Air and Water Pollution of the Committee on Public Works. United States Senate Ninetieth Congress Second Session of the extent to which environmental factors are considered in selecting power plant sites, with particular emphasis on the ecological effects of the discharge of waste heat into rivers, lakes, estuaries, and coastal waters. U.S Government Printing Office. Wash., D.C.. 2 Parts 1968.

600. Ushakov, B.P. Cellular resistance adaptation to temperature and thermostability of somatic cells with special reference to marine animals. Marine Biol. (W. Ger.) 1:153. 1968.

601. Wohlschlag, D.E., J.N. Cameron, and J.J Cech. Jr Seasonal changes in the respiratory metabolism of the pinfish (*Lagondon rhomboides*). Contr. Mar. Sci. 13:89. 1968

602. Zarenkov, N.A. Distribution of specific diversity within northern and southern temperature decapod faunas in relation to temperature. Dokl. Akad. Nauk. SSSR (USSR) 175:932, 1967; Dokl. Biol. Sci. 175:433, 1967.

603. Anon. Pesticide-wildlife studies. A review of fish & wildlife service investigations during 1961 and 1962 Fish and Wildlife Serv. Circ. 167. 109 mimeo p. 1963.

604. Alderdice, D.F. Some effects of simultaneous variation in salinity, temperature and dissolved oxygen on the resistance of young coho salmon to a toxic substance. Jour Fish Res. Bd. Can. 20:525. 1963.

605. Bedrosian, P.H. Relationship of certain macroscopic marine algae to zinc-65. Diss. Abs. 22:3146, 1962; Water Poll. Abs. 36:824, 1963.

606. Bernard, F.J., and C.E. Lane. Effects of copper ion in oxygen uptake by planktonic cyprids of the barnacle *Balanus amphitrite niveus*. Proc. Soc. Exptl. Biol. Med 113:418, 1963; Chem. Abs. 59:10510, 1963.

607. Brahins'kyyi, L.P., and L.P. Rotovs'ka. Effect of herbicide 2,4-D on pond invertebrates. Dopovidi Akad. Nauk Ukrain. R.S.R. 4:529, 1960; Biol. Abs. 41:9058, 1963.

608. Bridges, W.R.. B.J. Kallman, and A.K. Andrews. Persistence of DDT and its metabolites in a farm pond. Trans. Amer. Fish. Soc. 92:421. 1963.

609. Bringmann, G., R. Kuehn, and D. Luedemann. Significance and objectives of biological water analysis. I,II. Gas-u Wasserfach 103:1127, 1962; Chem. Abs. 58:4301, 1963.

610. Bringmann, G., R. Kuehn, and D. Luedemann. Significance and objectives of biological water analysis. III. Methods for determining the toxic action of sewage. Gas-u Wasserfach 103:1232, 1962; Chem. Abs. 58·7709, 1963.

611. Butler, P.A.. and P.F. Springer. Pesticides–a new factor in coastal environments. Trans. Twenty-eighth North Amer. Wildlife Conf. and National Resources Conf. p. 378. 1963.

612. Cairns, J., and A. Scheier. The acute and chronic effects of standard sodium alkyl benzene sulfonate upon the pumpkinseed sunfish, *Lepomis gibbosus* (Linn.) and the bluegill sunfish *L. macrochirus* Rof. Proc. 17th Ind. Waste Conf. Purdue Univ., Ext. Ser. 112·14. 1963.

613. Carter, L. Bio-assay of trade wastes. Nature (Brit.) 196:1304, 1962; Water Poll. Abs. 36:1908. 1963.

614. Carter, L. Toxicity of trade wastes to fish. Effluent & Water Treat. Jour. 3:206. 1963.

615. Crance, J.H. The effects of copper sulfate on microcystis on zooplankton in ponds. Prog. Fish. Cult. 25:198. 1963.

616. Crandall, C.A., and C.J. Goodnight. Effects of sublethal concentrations of several toxicants on growth of the common guppy, *Lebistes reticulatus*. Limnol. and Oceanog. 7:233. 1962.

617. Davis, G.E., J. Foster, C.E. Warren, and P. Doudoroff. The influence of oxygen concentration on the swimming performance of juvenile Pacific salmon at various temperatures. Trans. Amer. Fish. Soc. 92:111. 1963.

618. Davis, J.T., and J.S. Hughes. Further observations on the toxicity of commercial herbicides to bluegill sunfish. Proc. Southern Weed Conf. 16:337, 1963; Chem. Abs. 59:11946, 1964.

619. Dean, J.M., and R.F. Burlington. A quantitative evaluation of pollution effects on stream communities. Hydrobiologia XXI:193. 1963.

620. Deubler, E.E.. Jr. and G.S. Posner. Response of postlarval flounders, *Paralicthys lethostigma*, to water of low oxygen concentrations. Copeia 1963:312. 1963.

621. Dickie, L.M., and J.C Medcof. Causes of mass mortalities of scallops (*Placopeeten magellanicus*) in the southwestern gulf of St. Lawrence. Jour. Fish. Res. Bd. Can. 20:451. 1963.

622. Douglas, N.H., and W.H. Irwin. Evaluation and relative resistance of sixteen species of fish as test animals in toxicity bioassays of petroleum refinery effluents. Proc. 17th Ind. Waste Conf. Purdue Univ., Ext. Ser. 112:57. 1962.

623. Douglas, N.H., and W.H. Irwin. Relative resistance of fish to petroleum refinery wastes. Part II. Ind. Water and Wastes 8:23, 1963; Pub. Health Eng. Abs. XLIII:1563, 1963.

624. Douglas, N.H., and W.H. Irwin. Relative resistance of fish to petroleum refinery wastes. Part III. Ind. Water and

Wastes 8:22. 1963; Pub. Health Eng. Abs. XLIII.1975, 1963

625. Elvins, B.J. Investigation of the animal population in polluted streams. Jour. and Proc. Inst. Sew. Purif. 6:569, 1962: Water Poll. Abs. 36:2107, 1963.

626. Etges, F.J. Effects of some molluscicidal chemicals on chemokinesis in *Australorbis glabratus.* Amer. Jour. Trop. Med. Hyg. 12:701. 1963

627. Fedii, S.P. The effect of wetting agents, used in the flotation process for concentration of iron ores, on the ichthyofauna in bodies of water. Fish. Ind., Moscow 38(4):29, 1962. Water Poll. Abs 36:2110, 1963.

628. Fingal, W., and H.M. Kaplan. Susceptibility of *Xenopu laevis* to copper sulfate. Copeia 1 155. 1963

629. Tuffery, G., and J. Verneaux. A method for the determination of river water biological quality Centre National d'Etudes Techniques et de Recherches Technologiques pour l'Agriculture, les Forets et l'Equipment Rural, Section Peche et Pisciculture. 1968; Sport Fish. Abs. 14:11433, 1969.

630. Angino, E.E. Arsenic in detergents: possible danger and pollution hazard. Science 168:389 1970

631 Pattison, E.S. Arsenic and water pollution hazard discussion. Science 170:870. 1970.

632. Angino, E.E. Arsenic and water pollution hazard discussion. Science 170:871. 1970

633 Knapp. C.E. Mercury in the environment Environ Sci. & Technol. 4:890. 1970.

634. Huang, J.C. Fate of organic pesticides in the aquatic system Proc. 25th Ind. Waste Conf., Purdue Univ (In press.)

635. Duke, T. Influence of environmental factors on the concentrations of zinc-65 by an experimental community Proc. 2nd Natl. Symp. Radioecol., Ann Arbor, Mich., p 355, 1969; Water Poll. Abs. (G.B.) 42:2341, 1969.

636. Hannerz, L. Accumulation, retention and elimination of zinc-65 in fresh-water organisms studied in pond experiments. Proc. 1st Intl. Congr Radiat. Prot Rome. It., p 417, 1968; Water Poll. Abs. (G.B.). 42:2139. 1969.

637 Lazrus, A.L. Lead and other metal ions in United States precipitation. Environ. Sci. & Technol 4 55. 1970.

638. Anon. Fishery publication index 1955-64. U.S. Fish and Wildlife Service Circ. 296. 1969

639 Bell. H.L., and A.V. Nebecker. Preliminary studies on the tolerance of aquatic insects to low pH. Jour. Kans. Entomol. Soc. 42:230 1969.

640 Cavalloro, R., and M. Merlini. Stable manganese and fallout radiomanganese in animals from irrigated eco-systems of the Po Valley. Jour Ecol. (Brit.) 48:924. 1967.

641. Drzycimski, I. A tube sampler for collecting bottom samples. Ekol. Pol. Ser. B Ref Dyskusjc 13:273, 1967; Biol. Abs. 50:45484, 1969.

642. Eriksen, C.H. Ecological significance of respiration and substrate for burrowing ephemeroptera. Can. Jour Zool. 46 93. 1968.

643 Hannerz, L Experimental investigations on the accumulation of mercury in water organisms. Rept. Inst. Freshwater Res. Drottningholm (Sweden) 48:120. 1968.

644. Hynes, H.B.N., and M.J. Coleman A simple method of assessing the annual production of stream benthos. Limnol. Oceanog. 13:569 1968.

645. Ide. F. Effects of pesticides (toxicants) on stream life Devs. Ind. Microbiol. 9:132. 1968.

646. Moore, W.G., and A. Burn. Lethal oxygen thresholds for certain temporary pond invertebrates and their applicability to field situations. Ecology 49:349 1968.

647. Rueger M.E. T.A. Olson, and J.L. Scofield. Oxygen requirements of benthic insects as determined by manometric and polarographic techniques. Water Res 3.99 1969

648. Warnick S.L., and H.L. Bell The acute toxicity of some heavy metals to different species of aquatic insects. Jour. Water Poll Control Fed. 41 280 1969

649. Wilhm, J.L., and T.C Dorris. Biological parameters for water quality criteria. Bio-Science 18.477. 1968.

650. Young. J.P. The use of invertebrates in a water quality investigation a biological study of the Miami River, Ohio. Proc 3rd Ann. Amer. Water Res Conf 1967

651 Zahner. R. Experiments toward the analysis of biological, chemical and physical processes in the water-sediment interface of standing and slowly flowing waters I Description of the investigative set-up with preliminary results concerning the behavior of the tubificidae in choice investigations. Int Res Gesamten Hydrobiol. (Ger.) 52:627, 1967. Biol Abs. 50:6211 1969

652 Delfino. J.J., G.C. Bortleson and G.F. Lee Distribution of Mn, Fe, Mg, K, Na and Ca in the surface sediment of Lake Mendota, Wisconsin. Environ. Sci. & Technol. 3:1189 1969.

653 Putnam, H. Limiting factors for primary productivity in a West Coast Florida estuary Adv. Water Poll. Res., Proc 1st Conf 3:121. 1966: Chem. Abs. 71:128512. 1969

654. Beak. T.W. Ecological studies of aquatic environments. *In.* Background Papers Natl Conf. on Pollution and Our Environment. p 3, 1966, Council of Resource Ministers, Montreal, Que., 1967

655 Brinkhurst, R.O., D.L. Hamilton, and H.B. Herrington. Components of the bottom fauna of the St. Lawrence, Great Lakes. Great Lakes Inst., Univ of Toronto. Canada, PR 33. 1968.

656. Burgess. J.E Some effects of cultural practices on aquatic environments and native fish populations Proc. 19th Annual Conf.. S.E. Assn. Game Commrs.. p. 225 1966.

657. Cairns. J., Jr D.W. Albaugh, F. Busey. and M.D. Chanay A simplified method for non-biologists to estimate biological differences in stream pollution studies. This Journal 40(9):1607 Sept. 1968.

658 Chutter F.M., and R.G. Noble The reliability of a method of sampling stream invertebrates Arch Hydro-biol. (Ger.) 62:95 1966

659. Corey, S., and J.S. Craib. A new quantitative bottom sampler for meiofauna. Jour. Cons. Intl. Expl Mer (Denmark) 30:346. 1966.

660. Crocker, D.W., and D.W Barr. Handbook of the crayfishes of Ontario. Univ. Toronto Press, Toronto, Canada 1968.

661. Food and Agr. Org. of the U.N. World list of periodicals for aquatic sciences and fisheries. FAO Fish. Tech Paper No. 19 (Italy), 1, Supplement 3. 1966.

662. Hilsenhoff, W.L Ecology and population dynamics of *Chironomus plumosus* (Diptera: Chironamidae) in Lake Winnebago, Wisconsin. Annual Entomological Soc. Amer. 60:1183. 1967.

663. Hilsenhoff, W.L., and R.P. Narf. Ecology of Chironomidae, chaoboridae, and other benthos in fourteen Wisconsin lakes. Annual Entomological Soc. Amer. 61:1173. 1968.

664. Hubshman, J.H. Effects of copper on the crayfish *Orconectes rusticus* (Girard): I. Acute toxicity Crustaceana 12:33. 1967.

665. Hooper. F.F., and R.C. Ball. Bacterial transport of phosphorus in a stream ecosystem. Proc Intl. Atomic Energy Agency, p. 535. 1966.

666. Hutchinson, G.E. A treatise on limnology. Introduction to lake biology and the limnoplankton Vol. 2. John Wiley and Sons, New York. 1967.

667. Ingram, W.M., K.M. Mackenthun, and A.F. Bartsch Biological field investigative data for water pollution surveys. Publ. No. WP-13, Fed. Water Poll Control Admin., Washington, D.C. 1966.

668. Keup, L.E., W.M. Ingram, and K.M. Mackenthun. Biology of water pollution: a collection of selected papers on stream pollution, waste water, and water treatment. Publ. No. CWA-3. Fed. Water Poll. Control Admin.. Washington, D.C. 1967.

669. King, D.L.. and R.C. Ball. Comparative energetics of a polluted stream. Limnol. and Oceanog. 12:27. 1967.

670. Kovalsky, V.V., I.E. Vorotnitskaya, and V.S. Lekarev. Biochemical food chains of uranium in aquatic and terraneous organisms (algae, plantae, mollusea, pisces, sheep). Proc. Intl. Symposium on Radio-ecological Concentration Processes. Pergamon Press Ltd., London, England, p. 329. 1967.

671. Mackenthun, K.M. Biological techniques in the characterization of water quality. *In:* Proceedings of the Natl. Symposium on Quality Standards for Natural Waters. Univ. of Mich., Ann Arbor, p. 285. 1966.

672. McCauley, R.N. The biological effects of oil pollution in a river. Limnol. and Oceanog. 11:475. 1966.

673. Ravera, O. Stability and pattern of distribution of the benthos in different habitats of an alpine oligotrophic lake: lunzer untersee. Verh. Int. Verein Theor. Angew. Limnol. (Ger.) 16:233. 1966.

674. Scarola, J.F., and J.H. Gibberson. A device for sorting bottom organisms. Prog. Fish. Cult. 29:242. 1967.

675. Stewart, R.K., W.M. Ingram, and K.M. Mackenthun. Water pollution control, waste treatment, and water treatment–selected biological references on fresh and marine waters. Publ. No. WP-23, Fed. Water Poll. Control Admin., Washington, D.C. 1966.

676. Topp, R.W. An adjustable macroplankton sled. Prog. Fish. Cult. 29:184. 1967.

677. Walter, G. Ecological studies on the effect on aquatic organisms of brown-coal-mining waste waters containing ferrous iron. Wiss. Z. Karl-Marx-Univ. Lpz. (Ger.) 15:247. 1966.

678. Mackenthun, K.W., and W.M. Ingram. Biological associated problems in freshwater environments, their identification, investigation and control. U.S. Department of the Interior, Federal Water Pollution Control Administration, Washington, D.C. 1967.

679. Kaminski, A. Detection and quantitative determination of traces of insecticides in water by means of toxicodynamic asellus tests. Vehr. Int. Ver. Limnol. (Ger.) 16:969. 1966.

680. Kimerle, R.A., and W.R. Enns. Aquatic insects associated with midwestern waste stabilization lagoons. This Journal 40(2):R31. Feb. 1968.

681. Kreis, R.D., and W.C. Johnson. The response of macrobenthos to irrigation return water. This Journal 40(9):1614. Sept. 1968.

682. Mackenthun, K.M.. and W.M. Ingram. Biological associated problems in freshwater environments, their identification, investigation, and control. U.S. Dept. of the Interior, Federal Water Poll. Control Administration, Wash., D.C. 1967.

683. Olson, T.A., and M.E. Rueger. Relationship of oxygen requirements of immature aquatic insects to index-organism classification. This Journal 40(5):R188. May 1968.

684. Patrick, R., and J. Cairns. The relative sensitivity of diatoms, snails, and fish to twenty common constituents of industrial wastes. Progr. Fish. Cult. 30:137. 1968.

685. Read, K.R.H. Thermal tolerance of the bivalve mollusc *Lima scabra* Born, in relation to environmental temperature. Malacol. Soc. London Proc. (Brit.) 37:233. 1967.

686. Reid, G.K. Pond life: a guide to common plants and animals of North American ponds and lakes. Golden Press, New York. 1967.

687. Sanders, H. O., and O.B. Cope. The relative toxicities of several pesticides to naiads of three species of stoneflies. Limnol. Oceanog. 13:112. 1968.

688. Sugden, L.G. A technique for weighing live aquatic invertebrates. Limnol. Oceanog. 12:557. 1967.

689. Walter, G. Ecological studies on the effect of waste water from lignite surface mining and containing FE-II on the outfall organisms. Wiss Z. Karl-Marx-Univ. Leipzig Math Naturw Reihe (Ger.) 15(1):247, 1966; Biol. Abs. 48:113053, 1967.

690. Stefan, H., and F.R. Schiebe. Heated discharge from flume into tank. Jour. San. Eng. Div., Proc. Amer. Soc. Civil Eng. 96(SA6):1415. 1970.

691. Haverson, D. Mathematical model techniques for coastal waters. *In:* Advances in Water Pollution Research. Proc. 5th

Intl. Conf. Water Poll. Res., Pergamon Press, London, Eng. 1970.

692. Sugiki, A. Pollution forecasting in the estuary. Jour. Faculty Eng., Tokyo Univ., Ser. A, 6:12, 1968; Water Poll. Abs. (B.G.) 42:2307, 1969.

693. Siminov, A., and A. Justchak. The effect on the chemical content of sea water with a limited exchange of water from a large ocean of polluting discharges of chemicals. *In:* Advances in Water Pollution Research. Proc. 5th Intl. Conf. Water Poll. Res., Pergamon Press, London, Eng. 1970.

694. Chen, C.W. Effects of San Diego's wastewater discharge on the ocean environment. Jour. Water Poll. Control Fed. 42:1458. 1970.

695. Armstrong, N.E. Development of a gross toxicity criterion in San Francisco Bay. *In:* Advances in Water Pollution Research. Proc. 5th Intl. Conf. Water Poll. Res., Pergamon Press, London, Eng. 1970.

696. Klein, D.H., and E.D. Goldberg. Mercury in the marine environment. Environ. Sci. & Technol. 4(9):765. 1970.

697. Foyn, E. Disposal, distribution, and effects of organic and inorganic chemical waste in the marine environment. Rev. Intern. d'Oceanographic Medicale (Fr.) 18:51. 1970.

698. Parker, B., and G. Barsom. Biological and chemical significance of surface microlayers in aquatic ecosystems. BioScience 20(2):87. 1970.

699. Estes, J. E., and B. Golomb. Monitoring environmental pollution. Jour. Remote Sensing 1(2):8. 1970.

700. Ludwig, H.F., and P.N. Storrs. Effects of waste disposal into marine waters. A survey of studies carried out in the last ten years. Water Res. (G.B.) 4(11):709. 1970.

701. Mandelli, E.F. The inhibitory effects of copper on marine phytoplankton. Contributions in Marine Science 14:47. 1969.

702. Erickson, S.J. A screening technique for estimating copper toxicity to estuarine phytoplankton. Jour. Water Poll. Control Fed. 42:R270. 1970.

703. Aubert, M. Chemical pollution of the sea (methods of study and results). Rev. Intl. d'Oceanog. Med. (Fr.) 17:67 1970.

704. Hirayama, K., and R. Hirano. Influences of high temperature and residual chlorine on marine phytoplankton. Marine Biol. (W. Ger.) 7:205 1970.

705. LaRoche, G. Bioassay procedures for oil and oil dispersant toxicity evaluation. Jour. Water Poll. Control Fed. 42:1982. 1970.

706. Calabrese, A. Individual and combined effects of salinity and temperature on embryos and larvae of the coot clam, *Mulinia lateralis* (Say). Biol. Bull 137:417. 1969.

707. Calabrese, A., and H.C. Davis. Tolerances and requirements of embryos and larvae of bivalve molluscs. Helgolander wiss. Meeresunters (Ger.) 20:553. 1970

708. Ziebell, C.D. Field toxicity studies and juvenile salmon distribution in Port Angeles Harbor, Washington. Jour. Water Poll. Control Fed. 42:229. 1970

709. Courtright, R.C., and C.E. Bond. Potential toxicity of Kraft mill effluent after oceanic discharge. Progressive Fish Culturist 31:207. 1969.

710. Grigg, R.W., and R.S. Kiwala. Some ecological effects of discharged wastes on marine life. Calif. Fish & Game 56:145. 1970.

711. Cory, R.L., and J.W. Nauman. Effects of pulp mill effluents on the epifauna. Marine Poll. Bull. (G.B.) 87. 1970

712 Tarzwell, C.M. Thermal requirements to protect aquatic life. Jour. Water Poll. Control Fed. 42:824. 1970.

713. Chapman, W.H. Concentration factors of chemical elements in edible aquatic organisms. UCRL-50564. Lawrence Radiation Laboratory. Univ. of Calif.. Livermore. 1968.

714. Krauskof, K.B. Factors controlling the concentrations of 13 rare metals in sea water. Geochim Cosmochim. Acta 9:1. 1956.

715. Amend, D.F. Some factors influencing susceptibility of rainbow trout to the acute toxicity of an ethyl mercury phosphate formulation (Timsan). Trans. Amer. Fish Soc. 98:419. 1969.

716. Hughes, W.L. A physiochemical rationale for the biological activity of mercury and its compounds. Ann. N.Y. Acad. Sci. 65:454. 1957.

717 Boetius, J. Lethal action of mercuric chloride and phenylmercuric acetate on fishes Medd. Danm. Fisheri-og Havunders (Den.) 3:93. 1960

718. Holley C.W. Literature review of mercury wastes. TVA Internal Rept (Mimeo). 1969.

719. McKee, J.E., and H.W. Wolf Water quality criteria. 2nd Ed. Calif. State Water Quality Control Bd.. Publ. No. 3-A 216. 1963.

720 Anderson, B.G. The apparent thresholds of toxicity of *Daphnia magna* for chlorides of various metals when added to Lake Erie water. Trans. Amer Fish. Soc 78:96. 1948.

721. Jones, J.R.E. A further study of the relation between toxicity and solution press with *Polycelis nigra* as test animals. Jour Exp. Biol. 17:408. 1940

722. Bringham, G., and R. Kuhn The toxic effects of waste water on aquatic bacteria, algae, and small crustaceans Gesundh. Ingr. 80:115. 1959.

723. Ingols, R.S. Toxicity of mercuric chloride, chromic sulfate, and sodium chromate in the dilution BOD test. Sew. & Ind. Wastes 26.536. 1954.

724 Albert, A Selective toxicity. Methuen and Co., Ltd., London Eng. 49(247):276. 1965.

725 Battigelli, M.C. Mercury toxicity from industrial exposure: a critical review of the literature Jour Occup. Med. 2:7. 1960

726. Abedi, Z.H., and P.M. Scott. Detection of toxicity of aflatoxins, sterigmatocystin, and other fungal toxins by lethal action on zebra fish larvae Jour Assn. Offic. Anal. Chem. 52(5):963. 1969; Chem. Abs 71:89650. 1969.

727. Hutchinson, G.E. A treatise on limnology. Introduction to lake biology and the limnoplankton. Vol. 2. John Wiley and Sons, New York. 1967

728. Ingram, W.M., K.M. Mackenthun, and A.F. Bartsch. Biological field investigative data for water pollution surveys. Publ. No. WP-13. Fed. Water Poll Control Admin.. Washington, D.C. 1969

729. Holden, A.V. The possible effects on fish of chemicals used in agriculture. J. Inst Sew Purif. p. 361 368 1964

730. Keup, L.E., W.M. Ingram, and K.M Mackenthun Biology of water pollution: a collection of selected papers on stream pollution, waste water, and water treatment Publ No. CWA-3, Fed. Water Poll. Control Admin.. Washington. D.C. 1967.

731. King, D.L., and R.C. Ball. Comparative energetics of a polluted stream. Limnol. and Oceanog 12:27 1967

732. Kovalsky, V.V., I.E. Vorotnitskaya, and V.S. Lekarev. Biochemical food chains of uranium in aquatic and terraneous organisms (algae, plantae, mollusca, pisces, sheep). Proc. Intl Symposium on Radioecological Concentration Processes Pergamon Press Ltd., London. England. p 329 1967.

733. Mackenthun, K.M. Biological techniques in the characterization of water quality. Proceedings of the Natl Symposium on Quality Standards for Natural Waters. Univ. of Mich. Ann Arbor p. 285. 1966

734. McCauley, R.N. The biological effects of oil pollution in a river Limnol. and Oceanog. 11 475. 1966

735. Ravera, O. Stability and pattern of distribution of the benthos in different habitats of an alpine oligotrophic lake Lunzer Utersee. Verh. It. Verein Theor. Agew. Limnol. (Ger.) 16:233. 1966.

736. Scarola, J.F., and J.H. Gibberson A device for sorting bottom organisms. Prog. Fish Cult. 29:242. 1967

737. Stewart, R.K., W.M. Ingram, and K.M. Mackenthun. Water pollution control, waste treatment, and water treatment-selected biological references on fresh and marine waters. Publ. No. WP-23, Fed. Water Poll. Control Admin., Washington, D.C. 1966.

738. Topp, R.W. An adjustable macroplankton sled Prog. Fish Cult. 29:184. 1967.

739. Walter, G. Ecological studies on the effect on aquatic organisms of brown coal mining waste waters containing ferrous iron. Wiss. Z. Karl-Marx-Univ. Lpz (Ger.) 15:247 1966.

740. Mackenthun, K.W., and W.M. Ingram. Biological associated problems in freshwater environments, their indentification, investigation and control. U.S. Department of the Interior, Federal Water Pollution Control Administration, Washington, D.C. 1967.

741. Badenhuizen, T.R. Temperatures selected by *Tilapia mossambia* Peters) in a test tank with a horizontal temperature gradient. Hydrobiologia (Netherlands) 20:541. 1967.

742. Battaglia, B., and I. Lazzaretto. Effect of temperature on the selective value of genotypes of the copepod *Tisbe reticulata*. Nature (Brit.) 215:999. 1967.

743. Brock, T.D. Microorganisms adapted to high temperatures. Nature (Brit.) 214·882. 1967

744. Coble. D.W. Relationship of temperature to total annual growth in adult smallmouth bass. Jour. Fish. Res. Bd. Can. (Canada) 24:87. 1967.

745. Davidson, B., and R.W. Bradshaw. Thermal pollution of water systems. Environ. Sci. Tech. 1·618. 1967

746. Davis, W.S., and G.R. Snyder. Aspects of thermal pollution that endanger salmonid fish in the Columbia River. U.S. Bureau of Comm. Fish., Seattle, Wash., Staff Rep. (Mimeo). June 1967.

747 Denko, E.I. The influence of cultivation temperature on cellular resistance of *Cabomba aquatica* Aubl to various agents. *In* The Cell and Environmental Temperature. Pergamon Press Ltd., London. England, p. 161 1967.

748. Halcrow, K., and C.M. Boyd. The oxygen consumption and swimming activity of the amphipod *Gammarus oceanicus* at different temperatures. Comp. Biochem. Physiol. 23:233. 1967.

749. Hanec, W., and R.A. Burt The effect of temperature on the immature stages of *Culiseta inornata* (Dipera: Culicdae) in the laboratory. Can Entomol. (Canada) 99:59. 1967.

750. Harty, H. Nuclear power plant siting in the Pacific northwest. Final Rept. for Bonneville Power Admin., Cont. No. 14-03-67868. Battelle Memorial Institute, Pacific Northwest Laboratories. Richland, Wash. 545 p. and Appendices. July 1967

751. Irlina, I.S. Specific and non-specific changes in resistance of *Paramecium caudatum* adapted to different temperatures. *In:* The Cell and Environmental Temperature. Pergamon Press Ltd., London. England. p. 249. 1967.

752 Javaid, M.Y., and J.M Anderson. Thermal acclimation and temperature selection in Atlantic salmon, *Salmo salar,* and rainbow trout, *S. gairdneri* Jour. Fish. Res. Bd. Can. (Canada) 24:1507. 1967

753. Kennedy, V.S., and J.A. Mihursky. Bibliography on the effects of temperature in the aquatic environment. Univ. of Maryland, Nat. Resources Inst., Cont. No. 326. May 1967.

754. Lyutova, M.I., I.G. Zavadskaya, A.F. Luknitskaya, and N.L. Feldman. Temperature adaption of cells of marine and freshwater algae. *In:* The Cell and Environmental Temperature. Pergamon Press Ltd. London, England, p. 166. 1967.

755. Mihursky, J.A. On possible constructive uses of thermal addition to estuaries. Bio-Science 17:698. 1967.

756. Mihursky, J.A., and V.S. Kennedy. Water temperature criteria to protective aquatic life. Amer. Fish. Soc., Spec. Publ. 4:20. 1967.

757. Roux, C., and A.L. Roux. Temperature and respiratory metabolism of some sympatric species of gammarids of the pulex group. Ann. Limnol. 3:3. 1967.

758. Ryland, R.S., and J.H. Nichols. Effect of temperature on the efficiency of growth of placie prolarvae. Nature (Brit.) 214:529. 1967.

759. Sieburth, J. McN. Seasonal selection of esturine bacteria by water temperature. Jour. Exp. Mar. Biol. Ecol. 1:98. 1967.

760. Troshin, A.S. The cell and environmental temperature. Pergamon Press Ltd., London. England, 1967; Trans. Russian, Izdatelstov Nauka, Moscow. 1964.

761. Hawkes, H.Z. Ecological changes of applied significance induced by the discharge of heated waters. *In:* Parker, F.L.. and P.A. Krenkel (eds.). Engineering Aspects of Thermal Pollution. Vanderbilt Univ. Press, Nashville Univ. Press, Tenn. p. 15. 1969.

762. Hebb, C., D. Morris, and M.W. Smith. Choline acetyltransferase activity in the brain of goldfish acclimated to different temperatures. Comp. Biochem. Physiol. 28:29. 1969.

763. Hedgpeth, J.W., and J.J. Gonor. Aspects of the potential effect of thermal alteration on marine and estuarine benthos. *In:* Krenkel, D.A., and F.L. Parker (eds.). Biological aspects of thermal pollution. Vanderbilt Univ. Press, Nashville, Tenn. p. 80. 1969.

764. Hussein, M.F., N. Badir. and R. Boulos. Studies on the effect of insecticides as an ecologically induced limiting factor to the life of some fresh water fish: III. Effect of temperature on toxaphene toxicity to *Gambusia sp.* and *Tilapia zilli*. Zool. Soc. Egypt Bull. 21:22 (1966/1967), Biol. Abs. 50:103784, 1969.

765. Job, S.V. The respiratory metabolism of *Tilapia mossambia* (Telestei) II. The effect of size, temperature, salinity and partial pressure oxygen. Marine Biol. (W. Ger.) 3:222. 1969.

766. Kalininskaya, T.A., and R.S. Golovacheva. Effect of increased temperatures on the fixation of molecular nitrogen by microorganisms from thermal zones. Mikrobiologiga (USSR) 28:216. 1969, Biol. Abs. 50:93594, 1969.

767. Kalyuzhnaya, L.D., I.G. Kozhukhar. A.M. Bryaskaya, and A.P Rogozhina. Effect of temperature on the viability of actinomycetes. Microbiologyia (USSR) 27:843. 1968.

768. Kennedy, W.J., J.D. Taylor, and A. Hale. Environmental and biological controls on bivalve shell mineralogy. Biol. Rev. 44:499. 1969.

769 Ko, R.C., and J.R. Adams. The development of *Philonema oncorhynchi* (Nematoda: Philometridae) in *Cyclops bicuspidatus* in relation to temperature. Can. Jour. Zool. 47:307.

770. Krenkel, P.A., and F.L. Parker (eds.). Biological aspects of thermal pollution. Vanderbilt Univ. Press, Nashville, Tenn. 1969.

771. Lake, P.S. The effect of temperature on growth, longevity and egg production in *Chirocephalus diaphanua* Prevost (Crustacea: Anostraca). Hydrobiologia (Denmark) 33:342. 1969.

772. Lillelund, K. Experiments on the effects of light and temperature on rearing eggs of the pike, *Esox lucius*. Arch. Fisch. Will. (Ger.) 17 95, 1967; Biol. Abs. 50:87776, 1969.

773. Lowe, C.H., and W.G. Heath. Behavioral and physiological responses to temperature in the desert pupfish *Cyprinodon macularius*. Physiol Zool 42:53. 1969.

774. Macek, K.J., C. Hutchinson. and O.B. Cope. The effects of temperature on the susceptibility of bluegills and rainbow trout to selected pesticides Bull. Env. Contam. Toxicol. 4:174. 1969.

775 Maheshwari, R. Occurrence and isolation of thermophilic fungi. Curr. Sci. (India) 37:277, 1968; Biol. Abs. 50:54992, 1969.

776. Mangum, C.P., and C. Sassaman. Temperature sensitivity of active and resting metabolism in a polychaetus annelid. Comp. Biochem. Physiol. 30:111. 1969.

777. Masao, O., and S. Arasaki. Physiological studies on the development of the green alga *Ulva pertusa* I. Effect of temperature and light on the development of early stage. Rec. Oceanogr. Works Jap. 9.129, 1967; Biol. Abs. 50:83397, 1969.

778. Monut. D.I. Developing thermal requirements for freshwater fishes. *In:* Krenkel, P.A., and F.L. Parker (eds.). Biological Aspects of Thermal Pollution. Vanderbilt Univ. Press, Nashville, Tenn. p. 140. 1969.

779. Nagabhushanam, R., and R. Sarojini. Effect of temperature and salinity of the heat tolerance in the hermit crab, *Diogenes bicristimanus*. Hydrobiologia (Denmark) 34:126. 1969.

780. Ouchi, K. Effects of water temperature on the scale growth and width of the ridge distance in goldfish. Bull. Japan, Soc. Sci. Fish. 35:25. 1969.

781. Parker. F.L., and P.A. Krenkel (eds.). Engineering aspects of thermal pollution. Vanderbilt Univ Press, Nashville, Tenn. 1969.

782 Patrick, R. Some effects of temperature on freshwater algae. *In.* Krenkel, P.A., and F.L. Parker, (eds.). Biological Aspects of Thermal Pollution Vanderbilt Univ. Press Nashville Tenn. p. 161 1969

783. Pattee, E. Thermal coefficients and ecology of some fresh-water planarians. II. Tolerance of *Dugesia gonocephala*. Ann. Limnol. 4:99. 1968; Biol. Abs. 60:89677, 1969.

784. Payton, B.W., M.V.L. Benett, and G.D. Pappas. Temperature dependence of resistance at an electronic synapsus. Science 165:594. 1969.

785 Peterson, R.H., and J.M. Anderson. Effects of temperature on brain tissue oxygen consumption of Atlantic salmon, *Salmo salar*, acclimated to two temperatures. Jour. Fish. Res. Bd. Can. 26:93. 1969.

786. Poltoracka, J. Specific composition of phytoplankton in a lake warmed by water from a thermoelectric plant and lakes with a normal temperature. Acta Soc. Bot. Pol. (Poland) 3:297, 1968; Biol. Abs. 50:23148, 1969.

787. Poston, H.A., D.L. Livingston, and A.M. Phillips, Jr. The effect of source of dietary fat, caloric ratio, and water temperature on growth and chemical composition of brown trout. Fisheries Res., Rept No. 32, Cortland (N.Y.) Hatchery, p 14. 1969.

788 Precht I. Investigation on diapause capacity-adaption and temperature resistance of some insects and snails. Zeits. Wiss Zool 176:122, 1967: Biol. Abs. 50:22287. 1969.

789 Raney, E.C., and B.W. Manzel. Heated effluents and effects on aquatic life with emphasis on fishes--a bibliography. Cornell Univ. Water Resources and Marine Sci. Ctr., Philadelphia, Pa., and Ichtyol. Assoc Bull. No. 2. 1969.

790. Reed, P.H. Culture methods and effects of temperature and salinity on survival and growth of dungeness crab (*Cancer magister*) larvae in the laboratory. Jour. Fish. Res. Bd. Can. 27:389. 1969.

791. Regan, L. *Euphausia pacifica* and other euphausids in the coastal waters of British Columbia: relationships to temperature, salinity and other properties in the field and laboratory. Ph.D. dissertation, Univ. of British Columbia, Vancouver, B.C., 1968; Dissertation Abs. 30:905-B, 1969.

792. Savitz, J. Effects of temperature and body weight on endogenous nitrogen excretion in the bluegill sunfish (*Lepomis macrochirus*) Jour. Fish. Res. Bd. Can. 26:1813 1969.

793. Shabalina, A.A. Effects of cobalt chloride on physiological indices in the rainbow trout (*Salmo irideus* Gibbons). Prob. in Ichthyol. (USSR). Amer. Fish. Soc. Translation, 8:741. 1968, 1969.

794. Zorell, F. Temperature measurements and oxygen determinations in Lake Kochel. Limnol. Schr Reihe 14:7-30. 1956; Sport Fisheries Abs. Vol. 3, No. 3, 1958.

795. Shrable, J.B., O.W. Tiemeier, and C.W. Deyoe. Effects of temperature on rate of digestion by channel catfish. Prog. Fish Cult. 31:131. 1969.

796. Singh, D., M.L. Mammen, and M. Das. Effect of temperature on the extrinsic incubation of *Dirofilaria immitis* in *Aedes aegypti*. Bull. Indian Soc. Malaria Commun. Dis. 4:139, 1967; Biol. Abs. 50:112145, 1969.

797. Slobodskoi, L.I., et al. Analytical expression of the effect of temperature on microalgae productivity Biofizika (USSR) 14:196, 1969; Biol. Abs. 50:77558, 1969.

798 Smayda, T.J. Experimental observations on the influence of temperature, light, and salinity on cell division on the marine diatom, *Detonula confervacae* (Cleve) Gran Jour Phycol. 5:150. 1969.

799. de Silva, D.R. Theoretical considerations of the effects of heated effluents on marine fishes. *In* Krenkel, P A., and F.L. Parker (eds.). Biological Aspects of Thermal Pollution Vanderbilt Univ. Press, Nashville, Tenn., p. 229. 1969.

800. Tagatz, M.E. Some relations of temperature acclimation and salinity to thermal tolerance of the blue crab. *Callinectes sapidus*. Trans. Amer. Fish. Soc 98 713. 1969

801. Takarko, K.I. Sensitivity of pond carp to elevated temperature at different periods of embryonic development Girrobial. Zh., Acad. Nauk. Ukr. (USSR) 4 34 1968. Biol Abs. 50:104456, 1969.

802. Trukhin, N.J., and T.F. Mikryakova. Effect of temperature on the growth of Chlorella in intensive culture. Fiziol. Rast (USSR) 16:432, 1969; Biol. Abs. 50:128135 1969

803. U.S. Federal Power Commission. Problems in disposal of waste heat from steam-electric plants. U.S. Govt. Printing Office, Wash., D.C. 1969. 50 p.

804. van Uden, N., P. Abranches, and C. Cabeca-Silva. Temperature functions of thermal death in yeasts and their relation to the maximum temperature for growth. Arch. Mikrobiol. 61:381. 1968.

805. Vernberg, W.B., and F.J. Vernberg. Interrelationships between parasites and their hosts: IV. Cytochrome oxidase thermal-acclimation patterns in a larval trematode and its host. Exptl. Parasitol. 23:347, 1968: Biol. Abs. 50:55931, 1969.

806. Welch, E.B. Ecological changes of applied significance induced by the discharge of heated waters: discussion. *In:* Parker, F.L., and P.A. Krenkel (eds.). Engineering Aspects of Thermal Pollution. Vanderbilt Univ. Press, Nashville, Tenn., p. 58. 1969

807. Westin, L. Lethal limits of temperature for fourhorn sculpin *Myoxocephalus quadricornis* (L.). Rep. Inst. Freshwat. Res. Drottningholm (Sweden) 48:71 1968.

808. Winter, J.E. On the influence of food concentration and other factors in filtration and food utilization in the Mussels *Arctica islandica* and *Modiolus modiolus*. Marine Biol. 4:87 1969.

809. Wurtz. C.B. The effects of heated discharges on freshwater benthos. *In:* Krenkel, P.A., and F.L. Parker (eds.). Biological Aspects of Thermal Pollution Vanderbilt Univ. Press, Nashville, Tenn., p. 199 1969.

810. Moore, W.L., and C.W Morgan (eds.). Effects of watershed changes on streamflow Univ. of Texas Press, Austin. 1969.

811. Neuhasu, O.W., and J.E. Halver (eds.). Fish in research. Academic Press. New York, N.Y. 1969.

812. Mackenthun. K.M. The practice of water pollution biology. FWPCA Publ., U.S. Govt. Printing Office, Washington, D.C. 1969.

813 Anon. 12 selected articles from biological aspects of water reservoirs. U.S. Dept. of Commerce, Clearing House for Federal Scientific and Technical Information. 1968.

814. Mellanby, K. (ed.). Environmental pollution. Elsevier: Borkring, Essex. Eng. 1 1. 1970.

815 Whitley, L.S. and R.A. Sikora. The effect of three common pollutants on the respiration rate of tubificid worms. Jour. Water Poll. Control Fed. 42:R57. 1970.

816. Katz, M. The biological and ecological effects of acid mine drainage with particular emphasis to the waters of the Appalachian region. Impact of mine drainage on recreation and stream ecology Appendix F, ecology in acid mine drainage in Appalachia. Appalachian Regional Commission, Washington, D.C. 1969.

817 Bagge, P. Effects of pollution on estuarine ecosystems: I. Effects of effluents from wood-processing industries on the hydrography bottom and fauna of saltkallefjord (W. Sweden). Merentutkimuslaitoksen Julkaisu Havsforskningskist Skr. (Fin.) 228:3, 1969; Biol. Abs. 51:87942, 1970.

818. Bagge, P. Effects of pollution on estuarine ecosystems: II. The succession of the bottom fauna communities in polluted estuarine habitats in the Baltic-Skagerak region. Merentutkimuslaitoksen Julkaisu Havsforskningskist Skr. (Fin.) 228:119, 1969; Biol. Abs. 51:87943, 1970.

819. Bagge, P. The succession of the bottom fauna communities in polluted estuarine habitats. Limnologica (Ger.) 7:87. 1969.

820. Anon. Further review of certain persistent organochlorine pesticides used in Great Britain. Advisory Comm. on Pesticides and Other Toxic Chemicals, Dept. of Education

and Science, Her Majesty's Stationary Office, London, Eng. 1969.

821. Sanders, H.O. Toxicity of pesticides to the crustacean *Gammarus lacustris*. Bur. Sport Fisheries and Wildlife Tech. Paper 25. 1969.

822. Konar, S.K. Toxicity of heptachlor to aquatic life. Jour. Water Poll. Control Fed. 42:R299. 1970.

823. Schoettger, R.A. Toxicology of thiodan in several fish and aquatic invertebrates. Invest. Fish Control Bur. Sport Fish & Wildlife, No. 35. 1970.

824. Macek, K.J., and H.O. Sanders. Biological variation in the susceptibility of fish and aquatic invertebrates to DDT. Trans. Amer. Fish. Soc. 99:89. 1970.

825. Sanders, H.O. Toxicities of some herbicides to six species of freshwater crustaceans. Jour Water Poll. Control Fed. 42:1544. 1970.

826. Sears, H.S., and W.R. Meehan Short term effects of 2,4-D on aquatic organisms in the Nakwasina River watershed southeastern Alaska. U.S. Dept of the Int., Fish & Wildlife Serv., Bur. Comm. Fish., Biol Lab., Auke Bay, Alaska. 1969; Sport Fish Abs. 15:11569 1970.

827. Wilson, D.C.. and C.E. Bond. The effects of the herbicides diquat and dichlobenil (Casoron) on pond invertebrates. Pt. I. Acute toxicity. Trans. Amer. Fish Soc. 98:438. 1969.

828. DeSouza, C., and L. Paulini. Influence of pH in bioassays with pentachlorophenol and bayluscide. Rev. Brasil Malariol Doencas Trop. 19:413. 1967; Biol. Abs. 50:105284, 1969.

829. Bryan, G.W. The metabolism of zinc and zinc-65 in crabs, lobsters and freshwater crayfish. Proc. Intl. Symp. Radioecol. Concentr. Process. 1966, Stockholm, 1005, 1967. Water Poll. Abs. (G.B.) 42:2570, 1969.

830. Haanerz, L. Accumulation, retention and elimination of zinc-65 in freshwater organisms studied in pond experiments. Proc. 1st Intl. Congr. Radiat. Prot., 1966. Rome, p. 417, 1968; Water Poll. Abs. 42:2139. 1969.

831. Harrison, F.L. Accumulation and distribution of manganese-54 and zinc-65 in freshwater clams. Proc. 2nd Natl. Symp. Radioecol.. 1967 Ann Arbor, p. 198. 1969.

832. Harvey, R.S. Uptake and loss of radionuclides by the freshwater clam *Lampsilis radiata* (Geml.). Health Phys. 17 149. 1969.

833. Pauley, G.B., and R.E. Nakatani. Metabolism of the radio-isotope zinc-65 in the freshwater mussel *Anodonta californiensis*. Jour. Fish Res. Bd. Can. 25:2691 1968.

834. Wolfe, D.A., and C.L. Schelske Accumulation of fallout radio-isotopes by bivalve molluses from the Lower Trent and Neuse Rivers. Proc. 2nd Natl. Symp. Radioecol., 1967, Ann Arbor, 1969; Water Poll. Abs. 43:216, 1970.

835. Wilhm, J.L. Transfer of radioisotopes between detritus and benthic macroinvertebrates in laboratory microecosystems. Health Phys. 18:277. 1970.

836. Hynes, H.B.N. The ecology of flowing waters in relation to management. Jour. Water Poll. Control Fed. 42:418. 1970.

837. Jensen, L.D., et al. The effects of elevated temperature on aquatic invertebrates– a review of literature relating to fresh water and marine invertebrates. Johns Hopkins Univ., Cooling Water Studies Rept. No. 4. 1969.

838. Mackenthun, K.M. Temperature and aquatic life. Pub. Works 100(4):88. 1969.

839. Mackenthun, K.M., and L.E. Keup. Assessing temperature effects with biology. Proc. Amer Power Conf. 31:335 1969.

840. Wurtz, C.B. The effects of heated discharges on freshwater benthos. *In:* Krenkel, P.A and F.L Parker (eds.). Biological Aspects of Thermal Pollution. Vanderbilt Univ. Press, Nashville, Tenn. 1969.

841. Jonasson, P.M. Bottom fauna and eutrophication. *In* Eutrophication Causes, Consequences. Correctives. Proc. Symp. Natl. Acad. Sci., Washington, D.C. 1969.

842. Cordone. A.J.. and S.J. Nicola. Influence of molybdenum on the trout and trout fishing of Castle Lake. Calif. Fish & Game 56:77. 1970.

843. Patrick R. Benthic stream communities. Amer Scientist 58:546. 1970.

844. Clark. J.R. Thermal pollution and aquatic life. Sci. American 220:18. 1969.

845. Coe, M.J. Local migration of *Tilapia grahami* boulenger in Lake Magadi. Kenya in response to diurnal temperature changes in shallow water. African Wildlife Jour. 5 171. 1967.

846. Burns, C.W. Relation between filtering rate, temperature, and body size in four species of Daphnia. Limnol. Oceanogr. 14:693. 1969.

847. Cairns, J., Jr. The effects of heated discharges on fresh-water benthos: discussion. *In* Krenkel, P.A. and F.L Parker (eds.). Biological Aspects of Thermal Pollution. Vanderbilt Univ. Press, Nashville. Tenn., p. 214. 1969.

848. Brock, T.D., and H. Freeze. *Thermus aquaticus* gen. n. and sp. n., a nonsporulating extreme thermophile. Jour. Bacteriol. 98:289. 1969.

849. Brown, R.F., J.D. Wildman, and R.M. Eppley. Temperature-dose relationships with aflatoxin on the brine shrimp, *Artemia salina*. Jour. Assn. Offic. Anal. Chem. 51:905, 1968; Biol. Abs. 50:42162, 1969.

850. Brenko, M.H., and A. Calabrese. The combined effects of salinity and temperature on larvae of the mussel *Mytilus edulis*. Marine Biol. (W. Ger.) 4:224. 1969.

851. Brett, J.R., J.E. Shelbourn, and C.T. Shoop. Growth rate and body composition of fingerling sockeye salmon, *Oncorhynchus nerka*, in relation to temperature and ration size Jour. Fish. Res. Bd. Can. 26:2363 1969.

852. Beer. L.P., and W.O. Pipes. A practical approach to the preservation of the aquatic environment: the effects of discharge on condenser water into the Mississippi River. Commonwealth Edison Co., Chicago, Ill. 1969.

853. Bidgood, B.F., and A.H. Berst. Lethal temperatures for Great Lakes rainbow trout. Jour. Fish. Res. Bd. Can. 26:456. 1969.

854. Battelle-Northwest. Biological effects of thermal discharges: annual progress report for 1968. Reprinted from Pacific Northwest Lab. Annual Report for 1968 to U.S.A.E.C. Division of Biology and Medicine. Vol. I: Life Sciences, U.S.A.E.C. Res. and Dev. Rept. No. BNWL-1050, Battelle-NW, Richland, Wash. 49 p.

855. Beames, C.G., Jr., and R. Lindeborg, Temperature adaptation in the snail *Physa anatina.* Proc. Okla Acad. Sci. 48:12. 1969.

856. Baig, I.A., and J.W. Hopton. Phychrophilic properties and the temperature characteristic of growth of bacteria. Jour Bacteriol. 100:552. 1969.

857. Barnes, H., and M. Barnes. Seasonal changes in the acutely determined oxygen consumption and effect of temperature for three common cirripedes, *Balanus balanoides* (L.) *B. balanus* (L.), and *Chtamalus stellatus* (Poli). Jour. Exp. Mar. Biol. Ecol. 4:36. 1969.

858. Bachmann, K. Temperature adaptations of amphibian embryos. Amer. Nat. 103:115. 1969.

859. Bai, A.R.K., K. Srihari, M. Shadaksharaswamy, and P.S. Jyothy. The effects of temperature on *Blepharisma intermedium.* Jour. Protozool. 16:738. 1969.

860. Allen, J.F. Research needs for thermal-pollution control. *In* Krenkel, P.A., and F.L. Parker (eds.). Biological Aspects of Thermal Pollution. Vanderbilt Univ. Press, Nashville, Tenn., p. 382. 1969.

861. Averett, R.C. Influence of temperature on energy and material utilization by juvenile coho salmon. Ph.D. dissertation, Oregon State Univ., Corvallis, Ore.. 1969: Dissertation Abs. 29:4435-B, 1969.

862. Adams, J.R. Thermal power, aquatic life, and kilowatts on the Pacific Coast. Nuclear News, p. 75. Sept. 1969.

863. Alabaster, J.S. Effects of heated discharges on freshwater fish in Britain. *In:* Krenkel, P.A., and F.L. Parker (eds.). Biological Aspects of Thermal Pollution. Vanderbilt Univ Press, Nashville, Tenn., p. 354. 1969.

864. Hawkes, H.A. Biological detection and assessment of river pollution. Effluent and Water Treat. Jour. 3(12):651 1963.

865. Warren, J.W. Toxicity tests of erythromycin thiocyanate in rainbow trout. Prog. Fish. Cult. 25:88, 1963; Biol Abs. 43:8768, 1963.

866. Butler, P.A. Effects of pesticides on fish and wildlife in 1960. Additional commercial fisheries research needed. U.S. Fish and Wildlife Serv. Circ. 143, p. 28, 1962; Biol. Abs. 43:476, 1963.

867. Eldridge, E.F., (ed.). Water temperature, influences, effects and control. Proc. Twelfth Pac. Northwest Symp. on Water Poll. Res., U.S. Dept. Health, Educ. & Welfare Pub. Health Serv., Corvallis, Ore. 1963. 160 p.

868. Bodenstein, G., and G.M. Bastgen. Investigations into the toxicity of some herbicides for fish. 10. On the toxicity of modern pest-destroying agents for fish. Z. PflKrankh. 67:150, 1960; Water Poll. Abs. 36:518, 1963

869. Butler, P.A. Effects of pesticides on fish and wildlife in 1960. Effects on commercial fisheries. U.S. Fish and Wildlife Serv. Circ. 143, p. 20, 1962; Biol. Abs. 43:475, 1963.

870. Wollitz, R.E. Effects of certain commercial fish toxicants on the limnology of three cold-water ponds. Proc. Mont. Acad. Sci. 22:54, 1963; Chem. Abs. 59:9123, 1963.

871. Workman, G.W., and J.M. Neuhold. Lethal concentrations of toxaphene for goldfish, mosquito fish, and rainbow trout, with notes on detoxification. Proc. Fish. Cult. 25:23, 1963; Chem. Abs. 59:2005, 1963.

872. Weiss, C.M., and R.T. Oglesby. Instrumentation for monitoring water quality in reservoirs. Jour. Amer. Water Works Assn. 55:1213. 1963.

873. Whitworth, W.R., and W.H. Irwin. The minimum oxygen requirements of five species of fish under quiescent conditions. Proc. Fifteenth Ann. Conf. Southeastern Assn. Game & Fish Comm., p. 226. 1961.

874. Ward, C.K., and W.M. Irwin. The relative resistance of thirteen species of fishes to petroleum refinery effluent. Proc. Fifteenth Ann. Conf. Southeastern Assn. Game & Fish Comm., p. 255. 1961.

875. Warren, K.S. Ammonia toxicity and pH. Nature (Brit.) 195:47, 1962; Water Poll. Abs. 36:1179, 1963.

876. Tomiyama, T., K. Kobayashi, and K. Kawabe. The toxic effect of pentachlorophenate, a herbicide, on fishery organisms in coastal waters. II. The effect of PCP on conchocelis. Bull. Japan. Soc. Sci. Fish. 28:383. 1962.

877. Truelle, M.A. The effect on fish of waste waters from the manufacture of synthetic rubber. Ann. Acad. Tchecosl. Agric. 3(31):333, 1958; Water Poll. Abs. 36:2111, 1963.

878. Thompson, J.M. Mortality thresholds of fish in fly ash suspensions. Australian Jour. Sci. 25:414, 1963; Chem. Abs. 59:4310, 1963.

879. Timet, D. Studies on heat resistance in marine fishes. I. Upper lethal limits in different species of the adriatic littoral. Thalassia Jugoslavica 2(3):1. 1963.

880. Tamura, O., and M. Yasuda. Method for judging the physiological condition of fish by the quantitative changes of the blood characters. II. Bull. Faculty of Fish., Nagasaki Univ. 14:43. 1963.

881. Thomas, E.A. Zinc in water supplies as algal poison (cladophora, rhizoclonium). Arch. Mikrobiol. 42:246, 1962; Water Poll. Abs. 35:1930, 1962.

882. Surber, E.G., and T.O. Thatcher. Laboratory studies of the effects of alkyl benzene sulfonate (ABS) on aquatic invertebrates. Trans. Amer. Fish. Soc. 92:152. 1963.

883. Sproul, O.J., and D.W. Ryckman. Significant physiological characteristics of organic pollutants. This Journal 35(9):1136. Sept. 1963.

884. Sreenivasan, A., and R.S. Raj. Toxicity of Zn to fish. Current Sci. (India) 32(8):363, 1963: Chem. Abs. 59:14338, 1963.

885. Sprague, J.B. Resistance of four freshwater crustaceans to lethal high temperature and low oxygen. Jour. Fish. Res. Bd. Can. 20:387. 1963.

886. Sprague, J.B., and W.V. Carson. Chemical conditions in the northwest Miramichi River from 1960 to 1962. Fish. Res. Bd. Can., Biol. Stat. St. Andrews, N.B., Gen. Series Circular 38. 1963.

887. Silver, S.J., C.E. Warren, and P Doudoroff. Dissolved oxygen requirements of developing steelhead trout and chinook salmon embryos at different water velocities. Trans. Amer. Fish. Soc. 92:327. 1963.

888. Snow, J.R. Simazine as an algicide for bass ponds. Prog. Fish. Cult. 25:34, 1963; Biol. Abs. 42:20682, 1963

889. Seravin, L.N. Relationship between the time that aquatic animals survive and the concentration of a chemical agent in the medium. Tr. Petergofsk. Biol. Inst. Leningrad. State Univ. 19:149. 1962; Biol. Abs. 43:8628, 1963.

890. Shrivastava, H.N Oligochaetes as indicators of pollution Water and Sewage Works 109:387, 1962; Water Poll. Abs 36:2106, 1963

891. Roberts, H. Cadmium toxic to rainbow trout. Prog Fish Cult. 25:216. 1963

892. Schoenthal, N.D. Some effects of DDT on cold water fish and fish-food organisms. Mont. Fish & Game Dept Completion Rept for Jobs II & III, Proj F-21-R-4. 1963 47 p.

893. Ray, P. Evaluation of toxicity of some industrial effluents to fish by bio-assays Indian Jour. Fish 8:233. 1961; Water Poll. Abs. 36:2109. 1963.

894 Raymont, J E.G., and J. Shields. Toxicity of Cu and Cr in the marine environment. Air & Water Poll 7:4-5, 435 1963; Chem. Abs. 59:9123 1963.

895. Ramadan, F.M., H. Klimowicz, and A.A. Swelim The pollution effect of industrial wastes on rotifers. Polski. Arch. Hydrobiol 11(1):97 1963; Biol. Abs. 44:17774. 1963.

896 Rawls. C.K., and G.F Beaven. Results of a 1962 field experiment subjecting certain estuarine animals to 2,4-D ester. Proc. Southern Weed Conf 16 343 1963. Chem Abs. 59:6578, 1963

897. Privol'nev, T.I Threshold concentration of oxygen in water for fish at various temperatures. Dokl Akad. Nauk SSSR 151(2):439, 1963; Chem. Abs 59:10510 1963

898. Public Health Service. Bio-assay investigations–Buffalo River USPHS, 6 p.; Water Poll. Abs. 36:1692. 1963

899 Pearson E.A., R.D. Pomery. and J.E. McKee. Summary of marine waste disposal research program in California. State Water Poll Control Bd , Sacramento, Calif., Publ. 22. 1960 77 p.

900 Popov, A.V., and A.I. Zotin The relationship between the time of hatching of salmon and whitefish embryos and certain environmental factors. Rybnoe Khoz. 11:22, 1961, Biol. Abs. 41 17364, 1963.

901 Olift. W.D. Hydrobiological studies on the Tugeia River system. III. The Buffalo River. Hydrobiologia 21:355. 1963: Biol. Abs. 44:17763, 1963.

902 Patrick, R., and D. Strawbridge Methods of studying diatom populations. This Journal 35(2):151 February 1963.

903 Mulla, M.S., L.W. Isaak, and H Axelrod. Field studies on the effects of insecticides on some aquatic wildlife species. Jour Econ. Entom. 56:184. 1963; Pub. Health Eng. Abs. XLIII:1622, 1963.

904. Muncy, R.J., and A.D. Oliver Toxicity of ten insecticides to the red crawfish, *Procambarus clarki* (Girard). Trans. Amer. Fish. Soc. 92(4):428. 1963.

905. Mikhailov, V.V., and D.L. Teplyi The toxicity of blue-green algae from the Volga River. Zool Zhur. 40(11):1619, 1961; Biol. Abs. 43:4564. 1963.

906. Morrill, J.B. Morphological effects of cobaltous chloride on the development of *Limnaea stagnalis* and *Limnaea palustris.* Biol. Bull. 125(3 508. 1963

907 McDonald, S. Rapid detection of chlorinated hydrocarbon insecticides in aqueous suspension with *Gammarus lacustris lacustris* (Sars). Can. Jour. Zool. 40 719. 1962; Water Poll. Abs. 36:674 1963.

908. Ludemann, D. and H. Neumann. The effect of modern contact insecticides of freshwater fauna Anz. Schadlingskunde 35:5, 1962; Biol. Abs 44:4935 1963

909. Maldura, C Preliminary research on the action of alkylarylsulfonate on *Salmo irideus* Proc Gen Fish Council Mediterranean 6:203. 1961. Water Poll Ab 35:2407. 1962.

910. Lewallen, L.L., and W H Wilder Toxicity of certain organophosphorus and carbamate insecticides to rainbow trout. Mosquito News 22 369 1962; Chem. Abs. 58:11729, 1963.

911 Lloyd, R., and D.H.M. Jordan. Predicted and observed toxicities of several sewage effluents to rainbow trout. Jour. & Proc. Inst. of Sewage Purification 2 167. 1963.

912. Learner. M.A. and R.W. Edwards The toxicity of some substances to nais (oligochaeta). Proc Soc for Water Treat. and Exam. 12(3):161. 1963.

913. Lemke, A.E.. and D.I. Mount Some effects of alkyl benzene sulfonate on the bluegill, *Lepomis macrochirus.* Trans. Amer. Fish. Soc. 92(4):372 1963.

914. Knopp. H The A-Z test, a new process for toxicological testing of waste waters. Basis and description of the method. Deutsch Gewasserkundl. Mit. 5:66. 1961; Water Poll. Abs. 35:2404, 1962.

915 Lawrence, J.M. Aquatic herbicide data. U S. Dept of Agri.. Agri. Res. Serv Agri. Handbook No. 231 1962. 133 p.

916 Kalinina, E.M Safe and critical concentrations of oxygen for the young of black sea fishes. Tr Sevastopol'sk. Biol. Sta. Akad. Nauk USSR 14:215, 1961. Biol. Abs. 42:20616, 1963.

917 Khmeleva N.N. Accumulation of strontium, calcium, cerium and yttrium radio-isotopes by crustacea. Radiobiologiya 2:944, 1962; Water Poll. Abs 36:2199. 1963.

918. Irukayama, K., M. Fujiki. F. Kai, and T Kondo. Origin of the causative agent of minamata disease II. Comparison of the mercury compound in the shellfish from Minamata Bay with mercury compounds experimentally accumulated in normal shellfish. Kumamota Med. Jour. 15:1, 1962; Chem. Abs. 58:10560, 1963.

919. Ishio, S. The reactions of fishes to toxic substances. III. The reactions of fishes to hydrogen ion Bull Japanese Soc. Sci. Fish 29(7):682. 1963.

920. Beamish, F.W.H. Oxygen consumption of largemouth bass *Micropterus salmoides,* in relation to swimming speed and temperature. Can. Jour Zool. 48:1221. 1970.

921. Edwards, R.R.C., et al. A comparison of standard oxygen consumption of temperature and tropical bottom-living marine fish. Comp. Biochem. Physiol. 34:491 1970.

922. Braun, K., et al. The influence of temperature changes on enzymes of the fish muscle. Experiments with *Rhodeus amarus.* Marine Biol. (W. Ger.) 7:59. 1970.

923. Kruger, F. Investigations on the temperature dependence of the oxygen consumption of *Crepidula fornicata* (Mollusca: Prosobranchia). Marine Bio. (W. Ger.) 5:145 1970.

924. Akerlund, G. Oxygen consumption of the ampullariid snail *Marisa cornuarietis* L. in relation to body weight and temperature. Oikos, p. 20. 1969

925. Ostapenya. A.P., et al. Metabolic rate of *Diaptomus graciloides* (Lill.) at low temperature. Hydrobiol. Jour (USSR) Amer. Fish. Soc. Transl. 5:88. 1969.

926. Hughes, G.M., and J.L. Roberts. A study of the effect of temperature changes on the respiratory pumps of the rainbow trout. Jour. Exp. Biol. 52:177. 1970

927. McNabb, R.A., and G.E. Pickford. Thyroid function in male killifish, *Fundulus heteroclitus,* adapted to high and low temperatures and the fresh water and sea water Comp. Biochem. Physiol. 33:783. 1970.

928. Petitpren. M.F., and A.W. Knight Oxygen consumption of the dragonfly *Anax junius.* Jour Insect Physiol 16:449 1970.

929. Markel, R.P., Jr. Physiological responses to temperature acclimation in the limpet, *Acmaea limatula* Carpenter 1864. Ph.D. thesis, Stanford Univ., Calif., 1970 Dissertation Abs. 31:2244-B. 1970.

930. Hogan, J.W. Water temperature as a source of variation in specific activity of brain acetylcholinesterase of bluegills. Bull. Environ. Contam. Toxicol. 5:347. 1970.

931. Cross, F.A., et al. The effect of temperature. sediment, and feeding on the behavior of four radionuclides in a marine benthic amphipod. Nelson, D.J., and F.C. Evans (eds.). Proc. 2nd Natl. Symp. on Radioecology, U.S AEC Doc No. CONF-670503. p. 450. 1969.

932. Porcella, D.B., et al. Molting and calcification in *Daphnia magna* Physiol. Zool. 42:148. 1969.

933. Yoshida, Y. Studies on the efficiency of food conversion to fish body growth - IV effects of temperature to the coefficients β', β and γ. Bull. Jap. Soc Sci. Fish. 36:917 1970.

934. Moshiri, G.A., et al. Respiratory energy expenditure by the predaceous zooplankter *Leptodora kindtii* (Focke) (Crustacea: Cladocera). Limnol. & Oceanogr. 14:475. 1969.

935. McDiffett, W.F The transformation of energy by a stream detritivore. *Pteronarcys scotti* (Plecoptera) Ecology 51:975. 1970.

936 Angelovic, J.W., et al. Interactions of ionizing radiation, salinity and temperature on the estuarine fish. *Fundulus heteroclitus.* Nelson D.J., and F.C. Evans (eds.). Proc. 2nd Natl. Symp. on Radioecology. U.S. AEC Doc. No. CONF-670503, p. 131. 1969

937. Hirayama, K., and R. Hirano. Influences of high temperature and residual chlorine on marine phytoplankton. Marine Biol. (W. Ger.) 7:205. 1970.

938. Doemel, W.N., and T.D. Brock. The upper temperature limit of *Cyanidium caldarium.* Arch. Mikrobiol. (Ger.) 72:326. 1970.

939 Das, C.R. Thermal adaptation of photosynthesis in two algal strains. Current Sci. (Ind.) 38:396. 1969.

940 Hargreaves, B.T. Similarity of oxygen uptake by benthic communities. Limnol & Oceanogr. 14:801. 1969.

941 Ali, R.M. The influence of suspension density and temperature on the filtration rate of *Hiatella arctica.* Marine Biol. (W. Ger.) 6:291. 1970.

942. Manzi, J.J. The effect of temperature on the feeding rate of the rough oyster drill, *Eupleura caudata* (Say). Proc. Natl. Shellfish Assn. 60:54. 1969; Biol. Abs. 51:117211, 1970.

943. Manzi, J.J. Combined effects of salinity and temperature on the feeding, reproductive, and survival rates of *Eupleura candata* (Say) and *Urosalpinx cinerea* (Say) (Prosobranchia: Muricidae). Biol. Bull 138:35. 1970.

944. Cameron, J.N Growth respiratory metabolism and seasonal distributions of juvenile pinfish (*Lagodon rhomboides* Linnaeus) in Redfish Bay. Texas. Cont. in Marine Sci., Univ. of Texas, Austin 14.29. 1969; Sport Fishery Abs. 15:12046, 1970.

945. Fry, F.E.J., and P.W. Hochachka. Fish. *In.* Whittow, G.C. (ed.). Comparative Physiology of Thermoregulation, Vol. I. Invertebrates and Nonmammalian Vertebrates. Academic Press, New York, N.Y., p. 79. 1970.

946. Precht, H. The influence of 'normal' temperatures on life processes in poikilotherm animals exclusive of growth and development processes. Helgolander Wiss. Meerexunters (W. Ger.) 18:487, 1968; Biol. Abs. 51:79059, 1970.

947. Vernberg, F.J., and W.B. Vernberg. Aquatic invertebrates. *In:* Comparative Physiology of Thermoregulation, Vol. I. Invertebrates and Non-mammalian Vertebrates. Academic Press, New York, N.Y 1970.

948 Pavoni, M. Bluegreen algae literature for the years 1967 and 1968, with supplements for the years 1960 to 1966. Schweiz. Zeits. Hydrol. (Switz.) 31:6. 1969.

949. Mihursky, J.A. Patuxent thermal studies. Summary and recommendations. Natural Resources Inst. Univ. Maryland, College Park, Spec. Rept. No. 1. 1969.

950 Morgan, R.P., II, and R.G. Stross. Destruction of phytoplankton in the cooling water supply of a steam electric station. Chesapeake Sci. 10:165. 1969.

951. Cairns, J., Jr., et al. Occurrence and distribution of diatoms and other algae in the upper Potomac River. Notulae Naturae 436:1. 1970.

952. Roback, S.S., et al. Cluster analysis of occurrence and distribution of insect species in a portion of the Potomac River. Hydrobiologia (Den.) 34 484. 1969.

953. Cairns, J., Jr and R.L. Kaesler. Cluster analysis of Potomac River survey stations based on protozoan presence-absence data Hydrobiologia (Den.) 34·414. 1969

954. Russier, R. and C Lascombe The American planarian *Dugesia tigrina* in the Lyon region. ecology and thermal tolerance. Bull. Mensuel, Soc Linnee. de Lyon (Fr.) 39·197. 1970.

955. Herrmann, S.J. Systematics, distribution and ecology of Colorado hirudinea. American Midland Naturalist Test Matl. 83:1. 1970.

956 Barth, R. Occurrence of biological indicators in resurgence zones. Publ. Inst. Pesq. Mar (Braz.) 23.1. 1968; Biol Abs 51·134634, 1970.

957. Couture, R., and P Trudel Biology and ecology of *Pandalus montagui* Leach (Decapoda Natantia). I. Distribution and migrations at Grand Riviere (Gaspe), Quebec Natur Can 96:283, 1969 Biol Abs. 51:64748, 1970.

958. Zimmerman, U Ecological and physiological investigations of the planktonic blue-green algae *Oscillatoria rubescens* D.C under various conditions of light and temperature Schweiz. Zeits. Hydrol (Switz.) 31 i 1969.

959. Granberg, K Seasonal fluctuations in numbers and biomass of plankton of Lake Paajarvi Southern Finland. Ann. Zool. Fenn (Fin) 7 1. 1970· Biol. Abs. 51 111455, 1970.

960. Edsall, T.A., and P.J Colby Temperature tolerance of young-of-the-year cisco, *Coregonus artedii*. Trans. Amer Fish. Soc 99:526 1970.

961. Dahlberg, M.D and F.G Smith Mortality of estuarine animals due to cold on the Georgia coast. Ecology 51 931 1970.

962. Graham, J.B Temperature sensitivity of two species of intertidal fishes. Copeia 1970:49 1970

963. Soldwedle, R., and A.B. Pyle. The survival and growth of three strains of rainbow trout (*Salmo gairdneri*) under conditions of high natural temperatures with and without other fishes. New Jersey Dept. of Conservation and Economic Development Misc. Rept No. 29. 1968; Sport Fishery Abs. 15·11854, 1970.

964. Edsall, T.A., et al Temperature tolerance of bloater (*Coregonus hoyi*). Jour Fish. Res. Bd. Can. 27·2047. 1970.

965 Weatherly, A.H. Effects of super-abundant oxygen on thermal tolerance of goldfish Biol. Bull. 139:229 1970.

966 Smith. W.E. Tolerance of *Mysis relicta* to thermal shock and light. Trans. Amer. Fish. Soc 99:418. 1970.

967. Haefner. P.A., Jr. The effect of low dissolved oxygen concentrations on temperature-salinity tolerance of the sand shrimp, *Crangon septemspinosa* Say Physiol. Zool 43:30. 1970.

968. Regnault, M. Influence of temperature and origin of the sea water on larval development of *Hippolyte inermis* Leach (Decapoda-Natantia) in the laboratory Vie Milieu (Fr.) 20:137, 1969: Biol. Abs. 51 128230, 1970.

o969.Winterbourn, M.J Water temperature as a factor limiting the distribution of *Potamopyrgus antipodum* (Gastropoda-Prosobranchia) in the New Zealand thermal region. New Zeal. Jour. Mar Freshwater Res. 3:453, 1969; Aquatic Biol. Abs. (G.B.) 2:Aq1997, 1970.

970 Kahler, H.H. On the influence of adaptation temperature and salinity on heat and cold resistance of *Enchytraeus albidus* (Oligochaeta). Marine Biol. (W. Ger.) 5:315. 1970.

971. Meixner, R. Growth, molting and reproduction of *Crangon crangon* (L) in separate rearing. Berichte der Deutsch. Wissensch. Kimm. f. Meeresforschung (Ger.) 20.9 1969.

972. Andersson, E. Life-cycle and growth of *Asellus aquaticus* (L) with special reference to the effects of temperature. Inst Freshwater Res. Drottningholm (Swed.), Rept. No. 49 1969

973. Kon T Fisheries biology and the inner crab IV The duration of planktonic stages estimated by rearing experiments of larvae. Bull. Jap. Soc. Sci Fish 36:219. 1970

974. Burgis, M.J The effect of temperature on the development time of eggs of thermocyclops sp. a tropical cyclopod copepod from Lake George, Uganda Limnol & Oceanog 15:742. 1970

975 Beach, N.W The oyster crab. *Pinnotheres ostreum* Say in the vicinity of Beaufort. N Carolina Crustaceana 17·187 1969; Biol. Abs. 51:93925, 1970

976. Corkett C.J and I.A. McLaren Relationships between development rate of eggs and older stages of copepods. Jour Mar Biol. Assn. U.K 50 161 1970

977 Newman G.G. Distribution of the abalone (*Haliotis midae*) and the effect of temperature on productivity Rep. of South Africa, Div. of Sea Fisheries Investigational Rept No. 74. 1969

978. Bott, T.L., and T.D. Brock. Growth rate of sphaerotilus in a thermally polluted environment Appl. Microbiol. 49·100 1970

979. Halbach. U The factors determining temporal variation in *Brachionus calyciflorus* Pallas (Rotatoria). Oecologia (Ger.) 4:262. 1970.

980. Rekubratskii, V.A., and B. Ya. Vilenkin. Formation of the diet of young sevan trout (*Salmo ischan typicus*) of different temperatures. Dokl. Akad Nauk Armenian SSR (USSR) 46·75, 1968; Biol. Abs. 51:93924, 1970.

981 Fitzgerald, G.P., and S.L. Faust. Bioassay for algicidal vs. algistatic chemicals. Water and Sewage Works 110:296. 1963.

982. Floch, H., R. Deschiens, and Y. Le Corroller Molluscidal properties of chevreul cuprosulfite salt in the control of bilharzia infections. Bull. Soc Pathol. Exotique 56(2):182 1963.

983. Fujiya, M. Studies on the application of dehydrogenating reaction to evaluate the effects of industrial wastes to oysters. Bull. Japanese Soc. Sci. Fish. 26:974, 1960: Water Poll. Abs. 36:523, 1963.

984. Glaser, R Possibilities of using bio-indicators in the radiological control of waters. Limnologica 1:281. 1963; Water Poll. Abs. 36:2118. 1963.

985. Gutknecht, J. Zn^{65} uptake by benthic marine algae Limnol. and Oceanog. 8:31. 1963.

986. Harry, H.W., and D.V Aldrich The distress syndrome in *Taphius glabratus* (Say) as a reaction to toxic concentrations of inorganic ions. Malacologi 1:283 1963

987. Hassall, K.A. A specific effect of copper on the respiration of *Chlorella vulgaris*. Nature (Brit.) 193:90, 1962; Water Poll. Abs. 35:2406, 1962.

988. Henderson, C., and Q.H. Pickering. Use of fish in the detection of contaminants in water supplies. Jour. Amer. Water Works Assn. 55:715. 1963.

989. Herbert, D.W.M. Toxicity of sewage for fish. Montes (France) 18:287, 1962; Biol. Abs. 42:12876, 1963.

990. Herbert, D.W.M., and J.M. Richards. The growth and survival of fish in some suspensions of solids of industrial origin. Internatl. Jour. Air Water Poll. 7:297, 1963; Public Health Eng. Abs. XLIII:2013, 1963.

991. Hoese, H.D. Salt tolerance of the eastern mudminnow *Umbra pygmaea*. Copeia 1963:165. 1963.

992. Howell, J.H., and W.M. Marquette. Use of mobile bioassay equipment in the chemical control of sea lamprey. U.S. Fish & Wildlife Serv. Spec. Sci. Rept Fish. 418:1, 1962; Biol. Abs. 41:4847, 1963.

993. Hunt, G.S. Water pollution and the ecology of some aquatic invertebrates in the lower Detroit River. Proc. Fifth Conf. on Great Lakes Res., Toronto, Can., Apr 9-10, 1962 Great Lakes Res. Div., Inst Sci. Technol Univ Mich., 9:29, 1962; Water Poll. Abs. 36:1222, 1963

994. Ikematsu, W., et al. The toxic effect of pentachlorophenate a herbicide, on aquatic organisms. Bull. Seikai Regional Fish. Res. Lab. 28:1. 1963.

995. Oswald, William J., and Suresh A. Gaonkar. Batch assays for determination of algal growth potential biostimulation assessment workshop. Eutrop. Biostim Ass. Workshop Proceedings (held in Berkeley, Calif., June 19-21, 1969). Spons. by Univ. of Calif. School of Pub. Health & Col. of Engr., Div. of Hydraulic & Sanitary Engr., Berkeley and U.S. Dept. of the Interior, Federal Water Poll. Cont. Assn., Pacific NW Water Lab. Nat. Eutrophication Prog., Corvallis, Ore. 1969. 280 p.

996. Bain, Richard C Jr. Algal growth assessments by fluorescence techniques. Biostim. Assess. Workshop. Eutrophication Biostimulation Assessment Workshop. Proceedings (held in Berkeley, Calif., June 19-21, 1969). Spons. by Univ. of Calif., School of Public Health & Col. of Engr. Div. of Hydraulic & Sanitary Engr. Sanitary Engr. Research Lab., Berkeley & U.S. Dept. of the Interior. Fed. Water Poll. Control Assn., Pacific NW Water Lab. Nat Eutrophication Prog., Corvallis, Ore. 1969. 280 p.

997. Pearson, E.A., E.J. Middlebrooks, M. Tunzi, A. Adinarayana, P.H. McGauhey, and G.A Rohlich. Kinetic assessment of algal growth. Biostimulation Assess. Workshop. Eutrophication–Biostimulation Assessment Workshop. Proceedings (held in Berkeley, Calif., June 19-21, 1969). Spons. by Univ. of Calif., School of Public Health & Col. of Engr. Div. of Hydraulic & Sanitary Engr. Sanitary Engr. Research Lab., Berkeley & U.S. Dept. of the Interior Fed. Water Poll. Control Assn., Pacific NW Water Lab, Nat. Eutrophication Prog., Corvallis, Ore. 1969. 280 p.

998. Brown, Randall, and James Arthur. Effect of surface/volume relationship CO_2 addition, aeration, and mixing on nitrate utilization by Scenedesmus cultures in subsurface agricultural waste waters. Eutrop. Biostim. Ass. Workshop. Proceedings (held in Berkeley, Calif., June 19-21, 1969). Spons. by Univ of Calif., School of Pub. Health & Col. of Engr. Div. of Hydraulic & Sanitary Engr., Berkeley and U.S. Dept. of Interior, Fed. Water Poll. Cont. Assn., Praific NW Water Lab. Nat. Eutrophication Prog., Corvallis, Ore. 1969. 280 p.

999. Holm-Hansen, Osmund. Environmental and nutritional requirements for algae. Biostim. Ass. Workshop. Eutrophication–Biostimulation Assessment Workshop. Proceedings (held in Berkeley, Calif., June 19-21, 1969). Spons. by Univ. of Calif., School of Public Health & Col. of Engr. Div. of Hydraulic & Sanitary Engr., Sanitary Engr. Research Lab, Berkeley & U.S. Dept. of the Interior, Fed. Water Poll. Control Assn., Pacific NW Water Lab, Nat. Eutrophication Prog., Corvallis, Ore. 1969. 280 p.

1000. Storrs, Philip N. Biostimulation and toxicity criteria and applications in design present practice and future possibilities. Biostim. Assess. Workshop. Eutrop. Biostim. Ass. Workshop. Proceedings (held in Berkeley, Calif., June 19-21, 1969). Spons. By Univ. of Calif., School of Pub. Health & Col. of Engr. Div. of Hydraulic & Sanitary Engr., Berkeley and U.S. Dept. of Interior, Fed. Water Poll. Cont. Assn., Pacific NW Water Lab, Nat. Eutrophication Prog. Corvallis, Ore. 1969. 280 p.

1001. Greenwald, Margaret. List of references on control of aquatic plants, including algae. Wisconsin University Water Resources Center Eutrophication Program, Madison.

1002. Ziebell, Charles D., Roland E. Pine, Alvin D. Mills, and Richard K. Cunningham. Field toxicity studies and juvenile salmon distribution in Port Angeles Harbor, Washington. Water Pollution Control Federation, Washington, D.C. Journal 42(2):229-236. Feb. 1970.

1003. Zarnecki, S. Algae and fish relationships. *In:* Jackson, Daniel F. (ed.). Algae, Man, and the Environment. International Symposium Sponsored by Syracuse University, N.Y. and N.Y. State Science Syracuse Univ., N.Y., held in Syracuse, N.Y., June 18-20. 1967. pp. 459-477. 1968.

1004. Hueck, H.J. Toxicology of marine pollutants. Marine Pollution Bulletin 1(3):44. March 1970.

1005. Zitko, V., D.E. Aiken, S.N. Tibbo, K.W.T. Besch, and J.M. Anderson. Toxicity of yellow phosphorus to herring (*Clupea harengus*), Atlantic salmon (*Salmo salar*), lobster (*Homarus americanus*), and beach flea (*Gammarus oceanicus*). Canada Fisheries Research Board, Journal 27(1):21-29. Jan. 1970.

1006. Anon. Industrial waste guide on thermal pollution. U.S. Dept. of the Interior. Federal Water Pollution Control Administration, Northwest Region, Pacific Northwest Water Laboratory, Corvallis, Oregon. Final report. September 1968. 118 p.

1007. Espino de la O, Ernesto, and E. F. Gloyna. Sulfide production in waste stabilization ponds. Texas University, Center for Research in Water Resources, Technical Report No. CRWR26. May 1967. 171 p.

1008. Nemerow, Nelson L., and M.C. Rand. Algal growth affected by degree and type of wastewater treatment. *In:* Jackson, Daniel F. (ed.). Algae, Man, and the Environment. International Symposium Sponsored by Syracuse University, N.Y. and N.Y. State Science Syracuse Univ., N.Y., held in Syracuse, N.Y., June 18-20, 1967. pp. 391-402. 1968.

1009. Sprague, John B. Promising anti-pollutant: Chelating agent NTA protects fish from copper and zinc. Wisconsin University, Water Resources Center, Eutrophication Program, Madison.

1010. Cairns, John, Jr. New concepts for monitoring aquatic life systems. Water Pollution Control Federation, Washington, D.C., Journal 42(1):77-82. Jan. 1970.

1011. Jackson, Daniel F. (ed.). Algae, Man, and the Environment. Proceedings, International Symposium Sponsored by Syracuse University, N.Y and N.Y. State Science Syracuse Univ., N.Y., held in Syracuse, N.Y., June 18-20, 1967. 1968. 560 p.

1012. Middlebrooks, E.J., T. E. Maloney, and C.F. Powers. Eutrophication -biostimulation assessment workshop. Proceedings. Held in Berkeley, Calif., June 19-21, 1969. Sponsored by Univ. of Calif., School of Public Health and College of Engr. Div. of Hydraulic and Sanitary Engr. Sanitary Engr. Research Lab., Berkeley, and U.S. Dept. of the Interior, Federal Water Pollution Control Association, Pacific NW Water Lab., Nat. Eutrophication Prog., Corvallis, Oregon. 1969. 280 p.

1013. Porcella, Donald B. Continuous-flow (chemostat) assays. Biostim. Assess. Workshop. Eutrophication—Biostimulation Assessment Workshop, Proceedings. Held in Berkeley. Calif., June 19-21, 1969. Sponsored by Univ. of Calif., School of Public Health and College of Engr. Div. of Hydraulic and Sanitary Engr. Sanitary Engr. Research Lab., Berkeley, and U.S. Dept. of the Interior, Federal Water Pollution Control Association, Pacific NW Water Lab., National Eutrophication Prog., Corvallis, Oregon. 1969. 280 p.

1014. Christie, A.E. Trisodium nitrilotriacetate and algae. Water and Sewage Works, Chicago, 117(2):58-59. Feb. 1970.

1015. Sparks, Richard E., John Cairns, Jr., and Frank B. Cross. Some effects of a neutral mixture of calcium oxide and sulfuric acid on channel catfish *Ictalurus punctatus* (Rafinesque). Kansas Academy of Science, Transactions, 72(1):1-15. 1969.

1016. Huner, J.V., B.F. Dowden, and H.J. Bennett. The effects of endrin on the oxygen consumption of the bluegill sunfish *Lepomis macrochirus*. Louisiana Academy of Sciences, Proceedings, 30:80-86. Dec. 1967.

1017. Weir, Patricia A., and Charles H. Hine. Effects of various metals on behavior of conditioned goldfish. Archives of Environmental Health, 20(1):45-51. Jan. 1970.

1018. Brown, Lewis R., and Robert G. Tischer. The decomposition of petroleum products in our natural waters. Mississippi State University, Water Resources Research Institute, State College, Report No. A-027-Miss. 1969. 40 p.

1019. Fitzgerald, G.P., Joseph Shapiro, C.R. Goldman, O.R. Armstrong, and Jack Myers. Provisional algal assay procedure. Wisconsin University, Water Resources Center, Eutrophication Program, Madison.

1020. Matton, Pierre, and Quentin N. LeHam. Effect of the organophosphate dylox on rainbow trout larvae. Canada Fisheries Research Board, Journal, 26(8):2193-2200. Aug. 1969.

1021. Jackson, Daniel F. The effects of algae on water quality. Wisconsin University, Water Resources Center, Eutrophication Program, Madison.

1022. Shiree, Hampton W., John Cairns, Jr., and William T. Walker. A simple apparatus for measuring activity patterns of fishes. Water Resources Bulletin, 4(3):27-43. Sept. 1968.

1023. Kariya, Teiji, Reiko Akiba, Shuko Suzuki, and Tsutomu Tsuda. Studies on the post-mortem identification of the pollutant in the fish killed by water pollution—IV. Detection of cyanide in the fish. Japanese Society of Science Fisheries Bulletin, 33(4):311-314. April 1967.

1024. Thirulmurthi, D., and Ernest F. Gloyna. Relative toxicity of organics to *Chlorella pyrenoidosa*. Texas University, Center for Research Water Resources, Technical Report No. CRWR 4. Nov. 1, 1965. 109 p.

1025. Anon. Selenium in plankton. Work Boat. New Orleans, 28(5):14-16, 24-25. June 1971.

1026. Anon. Research studies effects on fish of pulp effluents. Water and Pollution Control, 109(2):14. Feb. 1971.

1027. Stadnyk, Lelyn, Robert S. Campbell, and Thomas B. Johnson. Pesticide effect on growth and ^{14}C assimilation in a freshwater alga. Bulletin of Environmental Contamination and Toxicology, 6(1):1-8. Jan.-Feb. 1971.

1028. Ludke, J. Larry, M.T. Finley, and Christina Lusk. Toxicity of merex to crayfish, *Procambarus blandingi*. Bulletin of Environmental Contamination and Toxicology, 6(1):89-96. Jan.-Feb. 1971.

1029. Cairns, John, Jr., and Kenneth L. Dickson. A simple method for the biological assessment of the effects of waste discharges on aquatic bottom dwelling organisms. Water Pollution Control Federation, Washington. D.C., Journal, 43(5):755-772. May 1971.

1030. Hiltibran, Robert C. Effects of cadmium, zinc, manganese, and calcium on oxygen and phosphate metabolism of bluegill liver mitochondria. Water Pollution Control Federation, Washington, D.C., Journal, 43(5):818-823. May 1971.

1031. Lukyanenko, V.I., and L.A. Petukhova Changes in activity of cholinesterase in the muscles and amount of ammoniac in brain of phenol poisoned *Carassius carassius*. Newfoundland, Memorial University, St. Johns, Library Bulletin. 5(2):17. March 1971.

1032. Coutant, C.C. Thermal pollution biological effects. A review of the literature of 1968. BNWL-2376. Battelle-Northwest, Richland, Washington, Jour. Water Poll. Control Fed., 41:1036. 1969.

1033. Daniels, J.M., and K.B. Armitage. Temperature acclimation and oxygen consumption in *Physa hawnii* Lea (Gastropoda: Pulmonata). Hydrobiologia (Denmark), 33:1. 1969.

1034. Davis, H.C., and A. Calabrese. Survival and growth of larvae of the European oyster (*Ostrea edulis* L.) at different temperatures. Biol. Bull. 136:193. 1969.

1035. Davis, W.S. Conditions for coexistence of aquatic communities with the expanding nuclear power industry. Nuclear Safety, 10:292. 1969.

1036. Doudoroff, P. Developing thermal requirements for freshwater fishes: discussion. *In:* Krenkel, P.A., and F.L. Parker (eds.). Biological Aspects of Thermal Pollution. Vanderbilt Univ. Press, Nashville, Tenn. p 140. 1969

1037. Edwards, R.R.C., D.M. Finlayson, and H.H. Steele. The ecology of O-group plaice and common dabs in loch ewe. II. Experimental studies of metabolism. Jour. Exp. Mar. Biol. Ecol (Netherlands), 3:1. 1969.

1038. Ellis, R.A., and I.H. Borden. Effects of temperature and other environmental factors on *Notonecta undulata* Say

(Hemiptera: Notonectidae). Pan. Pac. Entomol., 45:20 1969; Biol. Abs. 50:84115, 1969.

1039. European Inland Fisheries Advisory Commission Working Party on Water Quality Criteria for European Freshwater Fish. Water quality criteria for European freshwater fish- water temperature and inland fisheries. Water Res. (Brit.) 3:645. 1969.

1040. Gatt, S. Thermal lability of beta galactosidase from pink salmon liver. Science, 164:1422. 1969.

1041 Gonor, J.J. Temperature relations of central Oregon marine intertidal invertebrates: a prepublication technical report to the Office of Naval Research. Dept. of Oceanography Oregon State Univ., Corvallis, Ore. 1968.

1042. Harvey, R.S Effects of temperature · the sorption of radionuclides by a blue-green alga. P· ·. Second Nat. Symp. Radioecology, Ann Arbor, Mich., May 1967, p. 266 1969.

1043. Hasanen, E., S. Kolehmainen, and J.K. Miettinen. Biological half-times of caesium-137 and sodium-22 in different fish species and their temperature dependence. Proc. 1st Int.

1044. Whitton, B.A Toxicity of zinc, copper & lead to chlorophyta from flowing waters. Archir fuer Mikrobiologie 72:353-360. 1970.

1045. Goodman, Alvin S., and Richard J. Tucker The varying mathematical model for water quality Water Research. New York, 5(5):227-241. May 1971.

1046. Annon. Copper in water: a bibliography U.S Dept. of the Interior, Water Res. Scien. Infor Center Bibliography Series No 204 July 1971. 190 p

1047. Anon. Manganese in water. a bibliography U S. Dept. of the Interior, Water Resources Scien Infor Center Bibliography Series No. 205. July 1971. 129 p.

1048. Anon. Magnesium in water. A bibliography U.S Dept. of the Interior. Water Resources Scien. Infor. Center Bibliography Series No. 206. July 1971 153 p.

1049. Anon. Mercury in water--a bibliography U.S. Dept of the Interior, Water Resources Scien. Infor. Center Bibliography Series No 207 July 1971 100 p

1050. Anon. Zinc in water. A bibliography. U.S. Dept. of the Interior, Water Resources Scien. Infor Center Bibliography Series No. 208 July 1971. 138 p.

1051. Stift, M.J. Copper/bicarbonate equilibria in solutions of bicarbonate ion at concentrations similar to those found in natural water. Water Research, New York, 5(5) 171 176 May 1971.

1052. Pakalnins A, and D.C Pollock. Stream sampling Water and Pollution Control, 109(7):32-33, 35. July 1971

1053 Anon. USGS completes nationwide reconnaissance of metals in streams. Water and Sewage Works. Chicago, 118(6):174-175. June 1971.

1054. Brown, Richard D. The use of biological analyses as indicators of water quality. Jour. of Environmental Health, 34(1):62-66. July-Aug. 1971.

1055 Feltz, H R William T Sayers, and H.P Nicholson National monitoring program for the assessment of pesticide residues in water. Pesticides Monitoring Journal, 5(1):54-62. June 1971

1056 Christman, Thomas E. Water pollution and expanding production in the steel, chemical, and petroleum industries. Environmental Side Effects of Rising Industrial Output, Seminar, Paper Alfred J Van Tassel (ed.). (Held in Hempstead, N.Y., 1970.) Sponsored by Hofstra Univ. Stud. in Soc. and Econ. Proc., Lexington, Mass. pp. 45-84 1970.

1057 Merlini, Margaret Carla Bigliocca, A. Berg, and G. Pozzi. Trends in the concentration of heavy metals in organisms of a mesotrophic lake as determined by activation analysis. See Citation No 71-5TB-703 pp. 447-458 Feb. 1971.

1058 Anon. Symposium on freshwater biology and electrical power generation Freshwater Biology and Electrical Power Generation. Part Two. Symposium Papers (Held April 22, 1971.) Sponsored by Central Elect. Research Lab., Surrey, England. *In* Central Electricity Res. Lab., Surrey, England Report No. RD/L/M 312 1971 141 p.

1059 Aitken, A. The effects of temperature and diet on aspects of the physiology of the rainbow trout (*Salmo gairdnerii*). See Citation No 71-5TB-717, p. 177-185. 1971.

1060 Van Atta Robert E Device for field determination of heavy metals in natural waters. Illinois University, Water Resources Center. Urbana Research Report No. 35. 1970. 52 p.

1061. Bernhard. M., and A Zattera A comparison between the uptake of radioactive and stable zinc by a marine unicellular alga. Italy Comitato Nazionale per l'Engergia Nucleare, Rome. Report No RT/BIO(70)52. 11 p.

1062 Bridges, David W The critical thermal maximum of juvenile spot *Leiostomus xanthurus* Lacepeda. North Carolina University, State College of Agriculture and Engineering, Raleigh, Water Resources Research Instit. Report No. 43. Jan. 29, 1971 46 p

1063 Bewers, J.M., and G.J. Pearson. Effects of pulp mill effluent on water quality and biota trace element characteristics. Canada. Bedford Institute of Oceanography. Report No. AOL-8. Nov 1970 36 p.

1064. Branica. M. Determination of zinc in the marine environment. See Citation No 71-5TC-377, p. 243-259. 1970.

1065 Burton, J.D., and T.M Leatherland. Mercury in a coastal marine environment Nature 231(5303):440-442. June 18, 1971.

1066 Callaway, R.J., and K.V. Byram. Mathematical model of the Columbia River from the Pacific Ocean to Bonneville Dam. Math. Model of the Columbia River from the Pacific Ocean to Bonneville Dam, Part II. Input-Output and Initial Verification Procedures. Report. U.S. Envir. Protection Agency, Water Quality Office, Northwest Region, Pacific NW Water Lab., Corvallis, Oregon Dec. 1970. 135 p.

1067 Crespo, J.R. Thermal pollution Environment Side Effects of Ris. Indust. Output. Seminar papers, Alfred J. Van Tassel (ed.). (Held in Hempstead, N.Y 1970.) Sponsored by Hofstra Univ School of Bus.. Hempstead, N.Y , Heath, Mass. p. 111-134. 1970.

1068 Carlsson, S., K. Liden, R Bertil, and R. Persson. Use of radionuclides for tracing the origin of marine oil pollution. See Citation No. 71-5TC-409, p. 361-369. Feb. 1971.

1069. Siegel, S.M., A. Eshelman, I. Umeno, N. Puerner, and C.W. Smith. The general and comparative biology of toxic metals and their derivatives: mercury The Gen. and Comparative Biol. of Toxic Metals and Their Derivatives: Mercury. 1971 34 p.

1070. Mitchell, Dee, and James C. Buzzell. Estimating eutrophic potential of pollutants. Amer. Society of Civil Engr. Sanitary Engr. Division Jour. 97(SA4):451-453. Aug. 1971

1071. Ju-chang-Huang, and Michael G. Hardie Treatment of refinery waste by physicochemical processes. Amer. Society of Civil Engr. Sanitary Engr. Div. Jour. 97(SA4):467-478. Aug. 1971.

1072. Anon. Industrial waste guide on thermal pollution Indust. Waste Guide on Therm. Poll. Report, U.S. Dept. of the Interior, Fed. Water Poll. Control Ass., Northwest Region. Pacific Northwest Lab., Corvallis, Oregon. Sept. 1968. 118 p.

1073. Ross, F. Fraser Warm water discharges into rivers and the sea. Institute of Water Pollution Control, Annual Conf. Proceedings. (Held in Blackpool. Eng., Sept. 8-11 1970) *In:* Water Poll. Control, 70(3):269-274. 1971.

1074. Marlow, W. F., and P.D. LaFleur Standard reference materials for the analysis of environmental samples See Citation No. 71-5TG-562, p. 91-94 February 1971

1075. Edmondson, W. T Fresh water pollution. Environment Resources, Pollution & Society, William W Murdoch (Ed.) Sinauer Associates Inc., Publishers, Stamford, Connecticut p. 213-229. 1971.

1076. Hokanson, Kenneth E.F., and Lloyd L Smith, Jr. Some factors influencing toxicity of linear alkylate sulfonate (LAS) to the bluegill. American Fisheries Society, Transactions, 100(1) 1-12 January 1971

1077. Tabata, Kenji. Studies on the toxicity of heavy metals to aquatic animals and the factors to decrease the toxicity -II The antagonistic action of hardness components in water on the toxicity of heavy metal ions. Tokai Regional Fisheries Research Laboratory, Bulletin No. 58 215-232 May 1969.

1078. Nishikawa, Katsuo and Kenji Tabata. Studies on the toxicity of heavy metals to aquatic animals and the factors to decrease the toxicity -III. On the low toxicity of some heavy metal complexes to aquatic animals. Tokai Regional Fisheries Research Laboratory Bulletin No. 58 233 241 May 1969.

1079. Karlgren, Lars, and Gunnar Ekedahl Intercalibration of methods for chemical analysis of water I. Permanganate methods for determining chemical oxygen demand. Vatten 27(1):32-43. 1971.

1080. Niklasson, Rune. Apparent versus total oxygen demand a big difference. Vatten, 27(1):107-119. 1971.

1081. Koh, Robert C. Y., and Loh-Nien Fan. Nutritional pollution begs for a solution. Water and Wastes Engineering, New York, 8(6):48-49, 52. June 1971.

1082. Stolzenbach, Keith D., and Donald R F Harleman. An analytical and experimental investigation of surface discharges of heated water U.S. Environmental Protection Agency, Water Quality Office Washington, D.C. Water Pollution Control Research Series No 1630 DJU. February 1971. 213 p.

1083. Eichelberger, James W., and James J Lichtenberg. Persistence of pesticides in river water. Environmental Science and Technology, Washington, D.C., 5(6):541-544. June 1971.

1084. Carpenter, Edward J. Effects of phosphorus mining wastes on the growth of phytoplankton in the Pamlico River estuary Chesapeake Science, 12(2):85-94. June 1971.

1085. Seenayya, G. Ecological studies in the plankton of certain freshwater ponds of hyderabad India II, phytoplankton–I. Hydrobiologia, 37(1):55-88. February 18, 1971

1086. Akiyama, Akio. Acute toxicity of two organic mercury compounds to the teleost, *Oryzias latipes*, in different stages of development. Japanese Society of Scientific Fisheries, Bulletin, 36(6):563-570 June 1970.

1087. Adams, James R. Thermal effects and California's waters. Thermal Effects and California's Waters, Paper 1969 13 p.

1088. Tabata, Kenji. Study on the toxicity of heavy metals to aquatic animals and the factors to decrease toxicity–I. On the formation and the toxicity of precipitate of heavy metals. Tokai Regional Fisheries Research Laboratory, Bulletin No. 58:203-214. May 1969.

1089 Sarma T. P. T. M. Krishnamoorthy and V. N. Sastry. An approach to the calculation of the allowable specific activities in marine fishes. Health Physics Journal, 20(1):23-30. January 1971.

1090. Flick D.F., H.F. Kraybill, and J. M. Fimitroft Toxic effects of cadmium. A review Environmental Research, 4(2):71-85. April 1971.

1091 Mawdesley Thomas, Lionel E. Toxic chemicals–the risk to fish. New Scientist London, 49(734) 74-75. January 14, 1971

1092 Bylinsky Gene Metallic menances in the environment Fortune, New York, 83(1):110-113, 125-126, 130. January 1971.

1093. Cairns John, Jr Ecological management problems caused by heated waste water discharge into the aquatic environment. Water Resources Bulletin, 6(6):868-878. December 1970.

1094 Williams, Louis G Concentration of ^{85}strontium and ^{137}cesium from water solutions by cladophoras, and pithophora. Journal of Phycology, 6(3):314-316. September 1970.

1095 Lange Willy. Cyanophyta-bacteria systems: Effects of added carbon compounds or phosphate on algal growth at low nutrient concentrations. Journal of Phycology, 6(3):230-234. September 1970.

1096 Yamagata, Noboru, and Itsuzo Shigematsu. Cadmium pollution in perspective. Tokyo, Institute of Public Health, Bulletin, 19(1):1-27 1970.

1097 Cairns, John, Jr , and Kenneth I. Dickson. Reduction and restoration of the number of freshwater protozoan species following acute exposure to copper and zinc. Kansas Academy of Sciences, Transactions, 73(1):1-10. Spring 1970

1098 Fowler, Scott W. Distribution of ingested zinc-65 in the tissues of some marine crustaceans. Canada, Fisheries Research Board, Journal, 27(6):1051-1058. June 1970.

1099. McKim, J.M., G.M. Christensen, and Evelyn P. Hunt Changes in the blood of brook trout (*Salvelinus fontinalis*) after short-term and long-term exposure to copper Canada, Fisheries Research Board, Journal, 27(10):1883-1889 October 1970.

1100. Arthur, John W., and Edward N. Leonard. Effects of copper on *Gammarus pseudolimnaeus, Physa integra* and *Campeloma decisum* in soft water. Canada, Fisheries Research Board, Journal, 27(7):1277-1283. July 1970.

1101. Chow, Tsaihwa, J. Biogeochemical implications of lead in the hydrosphere. California, University, Project Clean Air. Research Reports, 2:F1-F23. September 1, 1970.

1102. Arthur, John W. Chronic effects of linear alkylate sulfonate detergent on *Gammarus pseudolimnaeus, Campeloma decisum* and *Physa integra*. Water Research New York, 4(3):251-257. March 1970.

1103. Walden, C.C., T.E. Howard, and G.C. Froud A quantitative assay of the minimum concentrations of Kraft Mill effluents which affect fish respiration. Water Research. New York, 4(1):61-68. January 1970.

1104. Bewtra. Jatinder K., William R. Nicholas, and Lawrence B. Polkowski. Effect of temperature on oxygen transfer in water Water Research, New York, 4(1):115-123. January 1970.

1105. Veith, Gilman D., and G. Fred Lee. A review of chlorinated biphenyl contamination in natural waters. Water Research, New York, 4(4):265-269. April 1970.

1106. Levinson, A.A. An improved dianthrimide technique for the determination of boron in river waters. Water Research. New York, 5(1):41-42. January 1971.

1107. Turnbull, H., J.G., DeMann, and R.F Weston. Toxicity of various refinery materials to fresh-water fish Industrial and Engineering Chemistry, 46:324. 1954.

1108. Wallen, I.E., W.C Greer, and R. Lasater Toxicity to *Gambusia affinis* of certain pure chemicals in turbid waters. Sewage and Industrial Wastes, 29(6):695. June 1957.

1109. Cairns, J. The relationship of body size of the bluegill sunfish to the acute toxicity of some common chemicals. Philadelphia Academy of Sciences (mineo). 1956.

1110. Gersdorff, W.A., and L.E. Smith. Effect of halogenation of phenol on its toxicity to goldfish. I. Monophenols. American J. Pharmacology, 112:197. 1940; Brit Chem. Physiol. Abstr. A., 111:761, 1940; Water Pollution Abs. p. 13, December 1940.

1111. Freeman, L. A standardized method for determining toxicity of pure compounds to fish. Sewage and Industrial Wastes, 25(7):845. 1953.

1112. Hart, W.B., P. Doudoroff, and J. Greenbank The evaluation of the toxicity of industrial wastes, chemicals, and other substances to freshwater fishes. Atlantic Refining Co 1945.

1113. Doudoroff, P., B.G. Anderson, G.E. Burdick, P.S Gatsoff, W.B. Hart, R Patrick, E.R. Strong, E.W. Surber, and W.M. Van Horn. Bio-assay methods for the evaluation of acute toxicity of industrial wastes. 23:11. November 1951.

1114. Anon. Tentative method of test for evaluating acute toxicity of industrial waste water to fresh-water fishes. A.S.T.M. Standards 1955, Part 7 (A.S.T.M. Designation: D1345-54T).

1115. Colby, P.J., and L.L. Smith, Jr. Survival of walleye eggs and fry on paper fiber sludge deposits in Rainy River, Minnesota. Trans. Amer. Fish. Soc. 96(3):278-296.

1116 Haydu, E.P., H.R. Amberg, and R.E. Dimick The effect of Kraft Mill waste components on certain salmonid fishes of the Pacific Northwest. Tappi 35:545-549.

1117 Jacques, A.G. The kinetics of penetration. XII. Hydrogen sulphide. J Gen. Physiol., 19:397-418. 1936.

1118. Pomeroy, R.D Hydrogen sulfide in sewage Sewage Works J. 13:498-505 1941.

1119 Shelford, V.E An experimental study of the effects of gas waste upon fishes, with special reference to stream pollution. Bull Ill. State Lab. Nat. Hist., 11:380-505. 1917.

1120. Van Horn. W.V., J.B. Anderson, and M. Katz The effect of Kraft pulp mill wastes on some aquatic organisms. Trans. Amer. Fish Soc., 79:55-63. 1949.

1121 Jones, J.R.E. A further study of the reactions of fish to toxic solutions. J Exp. Biol. 25(1):22-34. 1948.

1122. Dorris, T.C., W. Gould, and C.R. Jenkins. Toxicity bioassay of oil refinery effluents in Oklahoma. Trans. 2nd Sem. Biol. Probl. Water Pollut., R.A. Taft San. Engr. Center, Cincinnati, Ohio, Tech Rep. W60-3, p. 276-285. 1959.

1123. Harris. E.K. Confidence limits for the LD using the moving average-angle method. Biometrics, 15:424. 1959.

1124 Burdick, G. A graphical method for deriving threshold values of toxicity and the equation of the toxicity curve. N.Y. Fish and Game Jour 4:102. 1957.

1125. Grande, Magna. Water pollution studies in the River Otra, Norway -effects of pulp and papermill wastes on fish. Air Water Pollution, 8(1) 77-88, 1964, Chem Abs. Vol. 60, 15583a, 1964.

1126. Lyr, H. Enzymic detoxification of chlorinated phenols. Phytopathol. Z. 47(1):73-83, 1963; Chem. Abs. Vol. 59, No. 4296c. 1963.

1127. Nelson, Joseph S. Salinity tolerance of brook sticklebacks, *Culaea iconstans.* freshwater ninespine sticklebacks, *Pungitus pungitus* and freshwater fourspine sticklebacks, *Apeltas quadracus* Can. J. Zoo., 46(4):663-667. 1968.

1128. Carlson, Dale R. Fathead minnow *P promelas* Raf. in the Des Moines River, Boone County, Iowa and Skunk River Drainage, Hamilton and Stacy Counties, Iowa. Iowa State J. Sci. 41(3):363-374. 1967.

1129. Macleod, J.C. A new apparatus for measuring maximum swimming speeds in small fish J. Fish Res. Board Canada, 24(6):1241-1252. 1967

1130. Pickering, Q.H., and C. Henderson. The acute toxicity of some heavy metals to different species of warm water fishes. Air & Water Pollution Inst. Journal, 10:453-63. 1966.

1131. Skidmore, J.F. Toxicity of nine compounds to acquatic animals with special reference to fish. Quart. Rev. Biol. 39:227-248. 1964.

1132. Solon, Joseph M., Jeffrey L. Lincer, and John A. Nair, III. The effects of sublethal concentrations of LAS on the acute toxicity of various insecticides to the fathead minnow (*Pimephales promelas,* Rafen.). Water Res. 3(10):767-775. 1969.

1133. Rachlin, Joseph Wolfe, and Alfred Permutter. Response of an inbred strain of platyfish and the fathead minnow to zinc. Prog. Fish. Cult., 30(4):203-207.

1134. Pickering, Quentin H. Some effects of dissolved oxygen concentrations upon the toxicity of zinc to the bluegill, *Lepomis macrochirus,* Raf. Water Research Pergamon Press, 2:187-194. 1968.

1135. Mount, Donald I., and Charles E. Stephan. Chronic toxicity of copper to the fathead minnow (*Pimephales promelas*) in soft water. Jour. Fish. Res. Board of Canada, 26(9):2449-2457, 1969, or Water Res. 2:215-223.

1136. Hart, J.S. Lethal temperature relations of certain fish of the Toronto region. Trans. Roy. Soc. Canada, Sec. 5, 41:57-71.

1137. Howell, John H., and Paul M. Thomas. Anesthetic effect of 4-styryl pyridine on lamprey and fish. Trans. Amer. Fish. Soc. 93(2):206-8, 1964; Chem. Abs. 61:6097g, 1964 (*P. promeles*).

1138. Thatcher, Thomas O. Comparative toxicity of a mixture of hard ABS detergent products and all species of fish. Air Water Pollution, 10(a):585-90. 1966.

1139. Belding, D.L. Toxicity experiments with fish in reference to trade waste pollution. Trans. Amer. Fish. Soc. 57:100-119. 1927.

1140. Gersdorff, W.A. Effect of change of temperature on relative toxicity of rotenone and phenol. Jour. Agric. Res., 67(2):65-80. 1943.

1141. Marcus, Leslie F., and John H Vandermeer. Regional trends in geographical variation. Syst. Zool., 15(1):1-13. 1966.

1142. Macleod, John Cameron. Effects of suspended paper wood fiber on O_2 concentration and swimming endurance of the fathead minnow, *P. promelus.* Dissert. Abst., 25(9):4892-4893, abstract only.

1143. Mackiewkz-Golachowska, Jawiga. The influence of temperature and salinity on the decomposition of small quantities of phenol in water. Internat. Rev Gesamten Hydio Biol., 52(2):257-264, 1967; Biol. Abs. 49:36072, 1968.

1144. Hubschman, Jerry H. Effects of copper on the crayfish *Orconectes rusticus* (Girard) Crustaceana, 12:33-42. 1965.

1145 Flerov, B.A. The effect of phenol on the conditioned reflex activity of fish. Giarobiol. Zh., 1(3):49-50. 1965. (Russ.)

1146. Luk'yanenko, V I., and B.A. Flerov. Sensitivity and resistance of some species of freshwater fish to phenol Giarobiol. Zh., 1(2):48-53. 1965.

1147. Flerov, B.A. Effect of low phenol concentrations on the motor feeding activity and on the live weight increments in crucian carp. VOP Ikhtiol., 5(1):164-172. 1965.

1148. Veszpreori, Bela. Mass fish poisoning by hydrogen sulfide Orzagos Mezogaed Minosegvizsgalo Int. Evkonyne, 6:755-62, 1961-63, Chem. Abs 65:4326h, 1966.

1149. Hester, F. Eugene. The toxicity of noxfish and pro-noxfish to egg of common carp and fathead minnows. Proceed. 13 Annual Conf. Southeastern Ass. of Game and Fish Commissioners. p. 325-331.

1150. Prather, E.E. Further experiments on the feeds for fathead minnows. Proc. 12 Annual Conf. S.E. Ass. of Game and Fish Comm., October 19-22, 1958. 1959.

1151. Flickinger, Stephen A. Determination of sexes in the fathead minnow. Trans. Amer. Fish. Soc., 98(3):526-527.

1152. Andrews, Austin Kent. The distribution and life history of the fathead minnow (*Pimephales promelas* Rafinesque) in Colorado, Colorado State University, 1970. Dissertation Abs. 31:4392B, Order No. 71-2429. (Colorado State University, 1970) 1971. 141 p.

1153. Dorfman, Donald. Responses of some anadromous fishes to varied oxygen concentrations and increased temperature. Rutgers the State University of New Jersey, 1970; Dissertation Abs., 31:4759B, Order No. 71-3042, 1971.

1154. Marking, Leif L., Everett L. King, Charles R. Walker, and John H. Howell. Toxicity of 33NCS (3' Chloro-3 Nitro Sulfanilanilide) to freshwater fish and sea lamprey. U.S. Dept. of Interior, Bur. of Sportfishs' Wildl. Invest. in Fish Control, 37:3-11.

1155. Smith, R.J.H. A technique for marking small fish with injected fluorescent dyes. J. Fish Res. Bd. Canada, 27(10):1189-1891.

1156. Flerov, B.A. *Lebistes reticulatus* adaptation to phenol. Giarobiol. Zh. 6(3):104-6 (Russ.), 1970; Chem. Abs. 74(1):1583g, 1971.

1157. Brown, Vincent Mounce, D.G. Shuben, and Dennis Show. Water quality and the absence of fish from some polluted English rivers. Water Res., 4(5):363-82, 1970; Chem. Abs., 74(1):1590g, 1971.

1158 Aarnoi, A., and L. Meldy Molecular complexes of some phenols III. Tr. Tallinski Politekhn. Inst. Ser. A. 195:15-20. C.F.C.A. 58:11196b, 1962; Chem. Abs. 60:5196f, 1964.

1159. Skrapek, Karel. Toxicity of phenols and their detection in fish. Ustav. Vedeckjech. Inform Min. Zem edel, Vodniho Hospodarstvi Zivoasna Vyroba, *(8):499-504, 1963; Chem. Abs 60:5196h, 1964.

1160. Brungs, William A. Chronic effects of low dissolved oxygen concentrations on the fathead minnow (*Pimephales promelas*). J. Fish Res. Bd. Canada, 28(8):1119-1123.

1161. Schulze, E The effect of waste waters containing phenol on the taste of fish. Int. Rev. Hydro. Biol., 46:419-426, 1961; Water Pollut. Abs. 37(1):182, 1964.

1162. Gould, W.R., and T.C. Dorris. Toxicity changes of stored oil refinery effluents. J. Water Pollut Control Fed., 34:1107-1111. 1961.

1163. Lammering, M.W., and N.C. Burbank. The toxicity of phenol, o-chloro phenol, and o-nitro phenol to bluegill sunfish. Proc. 15th Industr. Waste Conf. Purdue Univ. Engr. Extn. Ser. No. 106:541-555; Sport Fishery Abs. 7 5028, 1962.

1164. Vernidub, M.F, The effect of drainage water of gas-shale industry on the physiological processes and growth of larvae and young salmon. Referal. Zhun Biol., No. 19178 B, 1962; Abs. 43(3):8764, 1963.

1165. Douglas, N.H. and William Irwin. Evaluation and relative resistance of 16 species of fish as test animals as toxicity bioassays of petroleum refinery effluents. Proc. 17 Indust. Waste Conf., Purdue Univ. Eng. Extn. Series No. 112:57-76.

1166. McKim, J.M., and D.A. Beneit Effect of long term exposures to copper on survival, reproduction, and growth of brook trout *Salvelinus fontinalis* (Mitchill). J Fish. Res. Bd. Canada, 28:655-662.

1167. Mount, Donald I., and Richard E. Warner. A serial-dilution apparatus for continuous delivery of various concentrations of materials in water. Phs. Publ. No. 999-wp-23. 16 p.

1168. Makhinya, A.P. Data for the hygiene substantion of the maximum permissible concentrations of sulfur dioxide gas in combination with phenol. Chem. Abs. 71:116259m. 1969.

1169. Pliev, T.N Analysis of the phenol-sodium phemolate system by ultra-voilet spectroscopy. Koks Khim. 7:38-40 (Russ.) 1969; Chem. Abs. 71:119467p. 1969.

1170. David, A., and P. Roy. Measurement ot toxicity of tannery and textile wastes and their components to fish by bioassays. Indian J. Fisheries, 7:423-42. 1960; Chem. Abs. 56:10729g, 1962.

1171. Pusey, Peter. Study of the rate of decay of concentration fluctuations in the critical region of a phenol water mixture, by using a photon correlation method. Dissertation Abs., 30(9):4298-9, 1970; Univ. of Pittsburg, Order No. 70-4270, 1969.

1172. Flerov, B.A. Chronic phenol poisoning of *Lebistes reticulatus.* Nauka Moscow USSR (Russ.) Chem. Abs. 74:84577g, April 26, 1971

1173. Semenchenko, L.V., and V T. Kaplin. Determination of traces of monohydric phenols in aqueous solutions by gas liquid chromatography. Z.H. Anal. Khim, 23(3):1257-9 (Russ.), 1968; Chem. Abs. 69:109653r, 1968

1174. Osada, Hirometsu, and Ikuko Goto. The relation between the freshness and the amount ot hydrogen sulfide in fish. Eryo to Shokurgo, 20(5):587-90 (Japan). 1968. Chem. Abs., 69:1871w, 1968.

1175. Henderson, C. Bioassay procedures aims and equipment. *In.* Biological Problems in Water Pollution 2nd Seminar, U.S Pub. Health Service, Cincinnati, Ohio. 1960.

1176. Luk'yanenko, V.I., and B.A. Flerov. Test data on toxicology of aging fish. Farmakoi, I. Toksikol, 26(5).625-9 (Russ.), 1963; Chem. Abs., 63:13626h, 1964.

1177. Beamish, F.W.H., and P.S. Mookherji. Respiration ot fishes with special emphasis on standard O_2 consumption. I. Influence of wt and temperature on the respiration of goldfish. Can. J. Zool., 42(2).161-75 1964; Chem. Abs., 60:16256d, 1964.

1178. Panovo, V.A., and Z.V. Nikolaeva. Separate gas-liquid chromatographic determination of monohydric phenols in waste waters. Ochistka Proizvod. Stochnykh Vod., 4:184-190 (Russ.), 1969; Chem. Abs. 72:136141r, 1970.

1179. Nadalin, Robert J. Detection of phenol in water Ger Offen., 1(923):189: Chem. Abs., 58882G, 1970. 10172; U.S. Appl. 14 May 1968 (in with potent papers)

1180. Pickering, Q.H., C. Henderson, and A.E. Lemke. The toxicity of organic phosphorus insecticides to different species of warm water fishes. Trans. Amer. Fish Soc., 91:175-185. 1962; Chem. Abs. 58:4848g, 1963.

1181. Smith, Lloyd L., Robert H. Kromer, and J. Cameron Macleod. Effects of pulpmill fibers on fathead minnows and wall eye fingerlings. J Water Pollution Cont. Fed., 37:130-140, 1965; Chem. Abs., 62·9513, 1965.

1182. Brebion, G., R. Cabridene, and B. Huriet. Studying the biodegradation possibilities of industrial effluents. Application to the biodegradation of phenols. Rev. Inst. Fr. Petrole Ann. Combust. Liquides, 22(6):1029-52 (Fr.), 1967; Chem. Abs. 67(93805n):8846, 1967 (Good abstract in Chem. Abs.).

1183. Markens, Henry C. Life history of the blackhead minnow (*Pimephales promelas*). Copeia, 1934:116-122.

1184. Pickering, Q.H., C. Henderson, and A.E. Lemke. The toxicity of organic phosphorus insecticides to different species of warm water fishes. Trans. American Fish Soc., 91:175-184. 1962.

1185. Tarzwell, Clarence M., and Croswell Henderson. Toxicity of Dieldrin to fish. Trans. Amer. Fish Soc. 86(1956):245-257. 1957.

1186. Macleod, John Cameron, and Lloyd I. Smith. Effect of pulpwood fiber on O concentration and swimming endurance of the fathead minnow *Pimephales promelas.* Trans. Amer. Fish Soc., 95(1):71-84, 1966; Chem. Abs., 64:18083y. 1966.

1187 Henderson, Croswell, and Quentin H. Pickering. Toxicity of oxygenic phosphorus insecticides to fish. Trans. Amer. Fish. Soc., 87:39-51 (Pub. 1958), 1957; Chem. Abs. 53:1959i, 1959.

1188. Merritt, Robert B. Factor dehydrogenase variation in the fathead minnow, *Pimephales promelas.* Univ. of Kansas, (Eng.), 1970, 67 p., Order No. 71-13-340: Dissertation Abs. Int. B, 31(11):6433, 1971.

1189. Lincer, Jeffrey L., Joseph Mi Solon, John H. Nair, III. DDT and endrin fish toxicity under static versus by bio-assay conditions. Trans. Amer Fish Soc., 99(1):13-19, 1970; Chem. Abs. 73:24796j, 1970.

1190. Clements, Howard P., and Woodrow H. Jones. Toxicity of brine water from oil wells. Trans. Amer. Fish. Soc., 84:97-109 (Pub. 1955). 1954.

1191 Burrage, Bryon R. Notes on some captive minnows *Pimephales promelas* Rafinesque. Trans Kansas Acad. Sci., 64(4):357-359. 1961

1192. Pickering, Quentin H. The acute toxicity of alkyl benzene sulfonate and LAS to eggs of fathead minnow *Pimephales promelas.* Air and Water Pollution Jour., 10(5):385-391. May 1965.

1193. Henderson, C., Q. H. Pickering, and C.M. Tarzwell. Relative toxicity of 10 chlorinated hydrocarbon insecticides to 4 species of fish. Trans. Amer. Fish. Soc., 88:23-32. 1959.

1194. Devi. Katragadda Vijaya Lakshmi. The effects of turbidity and light on the toxicity of two rotenone formulations to the fathead minnow (*Pimephales promelas*). Dessert. Abs., 23(3):1124-1125, 1962; Auburn Univ., Order No. 62-4008, 1962.

1195. Isaak, Daniel. The ecological life history of the fathead minnow *Pimephales promelas* (Rafinesque). Dessert. Abs., 22(6):2113-2114, 1961; Order No. 61-4598, Univ. of Minnesota, 1961.

1196. Brown, Vincent Mourill, and R.A. Dalton. Acute lethal toxicity to rainbow trout of mixtures of copper, phenol, zinc, and nickel. J. Fish. Biol., 2(3):211-216 Eng. 1970.

1197. Alabaster, J.S. Testing the toxicity of effluents to fish. Chem. Ind. (London), 24:759-64 Eng. 1970.

1198. Powers, E.B. Factors involved in the sudden mortality of fishes. Trans. Amer. Fish. Soc. 67:271. 1938.

1199. Black, H.H., G.W. McDermott, C. Henderson, W.A. Moore, and H.R. Pahren. Sewage and Industrial Wastes, 29(1):53. January 1957.

1200. Sprague, John B. Measurement of pollutant toxicity to fish II. Cetilizing and applying bio-assay results. Water Res., 4(1):3-32. 1970.

1201. Sprague, John B. Measurement of pollutant toxicity to fish I. Bio-assay method for acute toxicity. Water Res., 3(11):793-821. 1969.

1202. Doudoroff, P. Water quality requirements of fishes and effects of toxic substances. The Physiology of Fishes, edited by Margaret E. Brown, Academic Press, New York, pp. 403-443. 1957.

1203 Bender, Michael E. The toxicity of the hydrolysis and breakdown products of malathion to the fathead minnow (*Pimephales promelas* Rafin). Water Res., 26(9):2449-2457. 1969.

1204. Solis, Juan. Viral susceptibility range of the fathead minnow (*Pimephales promelas*) poikilothermic cell line. Appl. Micro., 19(1):1-4. 1970.

1205. Doudoroff, P. Some experiments on the complex cyanides to fish (to *Pimephales promelas*). Sewage and Indust. Wastes., 28(8):1020-1040. 1956.

1206. Hooper, Frank F., and Alfred R. Grzenda. The use of taxophene as a fish poison. Trans. Amer. Fish. Soc. 85:180-190. 1955

1207. Love, R. Malcalm. The chemical biology of fishes with a key to the chemical literature. Academic Press, New York. $21.00. 1970. 547 p

1208. Khobotev, V.G., and G.K. Buchvarov. Toxic influence of chemical substances such as paper industry wastes on green algae. Nauch Tr Vissh. Pedagog. Insti., Plovdiv, Mat., Fiz. Khim. Biol., 7(1):183-191 (Bulg.), 1969; Chem. Abs., 73:28624n, 1970 (*Scenedesmus quadricouda*).

1209. Gladysheva, A.T., and V.I. Lavrenchuk. Electrochemical oxidation of phenol. Uch. Zap. Tsenti Nauch. - Issled. Inst. Oloryani Prom. No. 1:68-78 (Russ.), 1966; Chem. Abs., 67(28639x):2697, 1967.

1210. Poda, George A. Hydrogen sulfide can be handled safely. Arch. Environ. Health, 12(6):795-800, 1966; Biol. Abs. 491968 56878.

1211. Lukena, G.A. Action of phenol on the photosynthesis and regeneration of chlorella. Vop Vodi Toksikol. 1970:183-5 (Russ.); Chem. Abs. 74:108291n. 1971.

1212. Lebedinskii, N.A. Effect of small concentrations of phenol on a change in the level of trace elements in carp. Vop, Vod. Toskikol, 1970:181-3 (Russ.); Chem. Abs., 74:108744n, 1971.

1213. Kirso, Uuve, and Ingeborg Veldre. Oxidation mechanism of phenols and toxicity of their degradation products. Festi NSV Teadi Akad. Toim, Keemi Geol., 20(1):26-30, 1971; Chem. Abs., 74:138729d, 1971.

1214. Alekseev, V.A. Acute phenol poisoning of some species of water insects and arachnids. Gidro Biol. Zh., 6(5):29-38 (Russ.), 1970; Chem. Abs., 74:137189r, 1971

1215. Koplin, V.T., L.V. Semenchenko, and E.G. Ivanov. Decomposition of a phenol mixture in natural waters minature scale operation. Gidrokhim Mater. 46:199-202 (Russ.), 1968; Chem. Abs. 69:69568h, 1968

1216. Abigneute, E. The toxicology of phenols. Biol. Chem. Form, 107(6):33-52 (Ital.), 1968. Chem. Abs., 69:65803h, 296 reference, 1968.

1217. Grunwald, Ernest and Mohindar S. Puar. Proton exchange of phenol in aqueous acid. J. Phys. Chem., 71(6):1842-5, 1967; Chem. Abs., 67:15317r, 1967

1218. Cherubim, Martin. Kinetics of the reaction between sulfur and phenol Kaut Gummi Kunstst., 19(11):676-82 (Ger.), 1966; Chem. Abs., 67(26146k):7484. 1967.

1219. Alferova, L.A. Oxidation of sulfur compound by atmospheric oxygen. Chem. Abs., 71:53326h. 1969.

1220. Huang, Ju-Chang. Effects of toxic organics of photosynthetic reoxygenation. Dissertation, U. of Texas, Austin, 1967. 179 p.; Avail. Univ. Microfilms. Ann Arbor. Mich., Order No. 68-4296.

1221 Kromer, David N., and Ethel B. Hockley. Assay of phenols and arylomines via peroxidutive coupling. Anal. Lett., 4(4):223-30 Eng., 1971; Chem. Abs. 75:44673, 1971.

1222. MacKiewkz - Golachowska, Jawiga. The influence of temperature and salinity on the decomposition of small quantities of phenol in water. Internat. Rev. Gesamten Hydrol. Biol., 52(2):257-264, 1957; Biol. Abs., 49:36072, 1968.

1223 Goncharov, G.D., and V.R. Mikryakov. The effect of small concentrations of phenol on outer body formation in the Carp *Cyprinus carp.* Vop. Vod. Toksikol., p. 171-5 (Russ.) 1970; Chem. Abs., 74:84578, April 26, 1971.

1224. Matei, V.E., and B.A. Flerov. Effect of subtoxic concentrations of phenol on the conditioned reflexes of *Lebistes reticulatus.* Vop. Vod. Toksikol., pp. 171-181 (Russ.) 1970; Chem. Abs. 74:84579J, April 26, 1971.

1225. Macek, Kenneth J., and William A. McAllister. Insecticide susceptibility of some common fish family representatives. Trans. Amer. Fish Soc., 99(1):20-7 1970.

1226. Wolff, Jean Jaques. Purification of phenolated water by ion exchangers. Chem. Ind. Genie Chem., 103(4):429-434 (Fr.), 1970; Chem. Abs., 73:38305y, 1970.

1227. Luk'yanenko, V.I., and L.A. Petukhova. Changes in the adurty of cholinesterase in the muscles and of ammonia in brains of phenol poisoned *Carassius carassius.* Tr. Inst. Biol. Vnutr. Vod. Akad. Nauk USSR, 10:311-18 (Russ.), 1966; Chem. Abs., 66(7808):83491, 1967.

1228. Irving, L. Blood and respiratory ability of freshwater fish. The Collecting Net, 14:77,84-85. 1939.

1229. Doudoroff, P. Some experiments on the toxicity of complex cyanides to fish. Sewage Ind. Wastes. 28:1020. 1956.

1230. Doudoroff, P., and M. Katz. Critical review of literature on the toxicity of industrial wastes and their components to fish. II. The metals, as salts. Sewage Ind. Wastes, 22:1432. 1950.

1231. Sanborn. N.H. The lethal effects of certain chemicals on fresh water fish. Canning Trade 67(49):10,26. 1945.

1232. Shepard, M.P. Resistance and tolerance of young speckled trout (*Salvelinus fontinalis*) to oxygen lack, with special reference to low oxygen acclimation. J Fisheries Research Board Can., 12:387. 1955.

1233. Townsend, L.D., and D. Earnest. The effects of low oxygen and other conditions on salmonoid fishes. Proc. Pacific Sci. Congr. Pacific Sci. Assoc. 6th Congr., 1939(3):345. 1940.

1234. Doudoroff, P., M. Katz, and C.M. Tarzwell. Toxicity of some organic insecticides to fish. Sewage Ind. Wastes, 25:840. 1953.

1235. Doudoroff, P., B.G. Anderson, G.E. Burdick, P.S. Galtsoff, W.B. Hart, R. Patrick, E.R. Strong, E.W. Surber, and W.M. Van Horn. Bio-assay methods for the evaluation of acute toxicity of industrial wastes to fish. Sewage Ind. Wastes, 23:1380. 1951.

1236. Ellis, M.M. Detection and measurement of stream pollution. U.S Bureau Fisheries Bull. No. 22. Bull. Bur. Fisheries, 48:365. 1937.

1237. Alderdice, D.F. The detection and measurement of water pollution biological assay. Canada Dept. Fisheries. 1967: Canadian Fisheries Rep., 9:33-39.

1238. Belding, D.L. The respiratory movements of fish as an indicator of toxic environment. Trans. Amer. Fish. Soc., 59:245-283. 1929.

1239. Brett. J.R. Some considerations in the study of respiratory metabolism in fish, particularly salmon. J. Fish. Res. Bd. Can., 19:1025-1038. 1962.

1240. Hart, W.B., P. Doudoroff, and J. Greenbank. The evaluation of the toxocity of industrial wastes, chemicals, and other substances to freshwater fishes. The Atlantic Refining Co., Philadelphia, Pa. 1945. 317 p.

1241. Henderson, C. Application factors to be applied to bioassays for the safe disposal of toxic wastes. Biological Problems in Water Pollution, Trans. of 1956 Seminar U.S. Public Health Service, R.A. Taft Sanit. Engrg. Center, Tech Rept. W60-3, 31-37.

1242. Henderson, C., and C.M. Tarzwell. Bioassays for control of industrial effluents. Sewage Ind. Wastes, 29:1002-1017. 1957.

1243. Krombach, H., and J. Barthel. Investigation of a small watercourse accidentally polluted by phenol compounds. Advances in Water Pollution Research, Proc. First Internat. Conf., held in London, 1962, Pergamon Press, Oxford, 1:191-198. 1964.

1244. Schaumburg, F.D., T.E. Howard, and C.C. Walden. A method to evaluate the effects of water pollutants on fish respiration. Water Research, 1:731-737. 1967.

1245. Anon. Effects of pollution on fish (*Pimephales*). Water Poll. Res., 1965:141-153.

1246. Vandermeer, John. Statistical analysis of geographical variation of the fathead minnow, *P. promelas*. Copeia, 3:457-466. 1966.

1247 Butt, J.R. Some lethal temperature relations of Algonquin Park fishes. Univ. Toronto Stud. Biol. Series, 52:1-49. 1944. (One of the fish was (*P. promelas*).)

1248. Klak, George E. Neascus infestation of blackhead, bluntnose and to other forage minnows. Trans. Amer. Fish. Soc., 69:273-278. 1940.

1249. Targwell, C.M., and C. Henderson. Toxicity of less common metals to fishes. U.S. Atomic Energy Comm. TID 7517 (pt. la):286-9, 1956: Chem. Abs. 51:3854b. 1957.

1250. Surber, Eugene, and Quentin H. Pickering. Acute toxicity of endottal diquat, hyomine dalagon, and silvex to fish. Prof. Fish. Culturest, 24:164-171. 1962. (*P. promelas*)

1251. Mount, Donald I The effect of total hardness and pH on acute toxicity of lime on fish. Our Water Pollution, 10(1):49-56. 1966; Chem. Abs. 64:18079a. 1969.

1252. Pickering, Quentin A., and Croswell Henderson. Acute toxicity of some important petro chemicals to fish. J. Water Pollution Control Fed., 38(9):1419-29 1966.

1253 Helsenhoff, William L. The evaluation of insecticides for the control of *Tendipes plumovsus* (Linnaeus). Jour. Econ. Int., 52(2):331-332. 1959.

1254. Lawrence, J.M. Toxicity of some new insecticides to several species of pond fish. Prof. Fish Culturest, 12(3):141-146. 1950.

1255. Warren, C.E., and P. Doudoroff. The development of methods for using bioassays in the control of pulp mill waste disposal. Tappi, 41:211A-216A. 1958.

1256. Wood, E.M. Definitive diagnosis of fish mortalities. J. Wat. Pollut. Control Fed., 32:994-999. 1960

1257. Select Committee on National Water Resources, United States Senate Electric power in relation to the nation's water resources. Committee Print No. 10. 1960.

1258. Arnold, G.E. Thermal pollution of surface supplies. JAWWA, 11 1962.

1259. Ross, F.F. The operation of thermal power stations in relation to streams. Journal and Proceedings, The Institute of Sewage Purification, Part I. 1959.

1260. Woodruff, R.S. Private power development of an entire river. Proceedings ASCE, Journal of the Power Division, July 1961.

1261. Committee on Thermal Pollution. Bibliography on thermal pollution. Proceedings ASCE, Journal of the Sanitary Engineering Division, June 1967

1262. Middlebrooks, E.J., and D.B. Porcella. Bioassays of productivity in natural waters. Presented at 32nd Annual Meeting of the American Society of Limnology and Oceanography, LaJolla, California. 1969.

1263. Pearson, E.A., E.J. Middlebrooks, M. Tunzı, A. Adinarayana, P.H. McGauhey, and G.A. Rohlich. Kinetic interpretation of assay data. Proceedings of the Eutrophication-Biostimulation Assessment Workshop, Edited by E.J. Middlebrooks et al., University of California, Berkeley. 1969.

1264. Pearson, E.A., P. Storrs, R. Selleck, and D. Jenkins. A comprehensive study of San Francisco Bay. University of California, Berkeley, Sanitary Engineering Research Laboratory. 1964.

1265. McGauhey, P.H., G.A. Rohlich, E.A. Pearson, M. Tunzi, A. Adinarayana, and E.J. Middlebrooks. Eutrophication of surface waters–Lake Tahoe–bioassay of nutrient sources. First Progress Report, Lake Tahoe Area Council, for FWPCA. 1968.

1266. McGauhey, P.H., G.A. Rohlich, E.A. Pearson, D.B. Porcella, A. Adinarayana, and E.J. Middlebrooks. Eutrophication of surface waters–Lake Tahoe–laboratory and pilot pond studies. 2nd Progress Report. 1969.

1267. McGauhey, P.H., G.A. Rohlich, E.A. Pearson, G.L. Dugan, D.B. Porcella, and E.J. Middlebrooks. Eutrophication of surface waters–Lake Tahoe–pilot ponds and field studies. Third Progress Report. 1970.

1268. Water Pollution Control Federation. Standard Methods for the examination of water and wastewater. 12th Edition, APHA, AWWA, WPCF, New York. 1965.

1269. Margalef, R. Perspectives in ecological theory The University of Chicago Press, Chicago, Illinois. 1968.

1270. Fruton, J.S., and S. Simmonds. General biochemistry. 2nd Edition, John Wiley and Sons, Inc., New York. 1958.

1271. Federal Water Pollution Control Administration. Water quality criteria. Report of the National Technical Advisory Committee to the Secretary of the Interior, April 1, 1968, Washington, D.C.

1272. Federal Water Pollution Control Administration. Water temperature–influences, effects, and control. Proceedings of the 12th Pacific Northwest Symposium on Water Pollution Research, Federal Water Pollution Control Administration, Northwest Region, Corvallis, Oregon, November 7, 1963.

1273. Dysart, B.C., and P.A. Krenkel. The effects of heat on water quality. Proceedings of the Purdue Industrial Wastes Conference, Purdue University. 1965.

1274. Sundaram, T.R., C.C. Easterbrook, K.R. Piech, and G. Rudinger. An investigation of the physical effects of thermal discharges into Cayuga Lake. Cornell Aeronautical Laboratory, Inc., Cornell University, Buffalo, New York. 1969.

1275. Federal Water Pollution Control Administration. Temperature and aquatic life–laboratory investigations. Technical Advisory and Investigations Branch, Report No. 6, Cincinnati, Ohio. 1967.

1276. Wallace, N.W. The effect of temperature on the growth of some freshwater diatoms. Notulae Naturae, 208:1. 1955.

1277. Warinner, J.E., and M.L. Brehmer. The effects of thermal effluents on marine organisms. International Journal of Air and Water Pollution, 4(10):277. 1966.

1278. Federal Water Pollution Control Administration. Industrial waste guide on thermal pollution. Federal Water Pollution Control Administration, Northwest Region, Pacific Northwest Water Laboratory, Corvallis, Oregon. 1968.

1279. Edwards, R.R.C., D.M. Finlayson, and J.H. Steele. The ecology of 0-group plaice and common dabs in loch ewe. II. Experimental studies of metabolism. Journal, Experimental Marine Biol. Ecol., 3:1-17. 1969.

1280. Elson, Paul F. Effects of current on the movement of speckled trout. Jour. Fish. Res. Bd. Can. 4(5):491-499. 1939.

1281. Edsall, Thomas A., Donald V Rottiers, and Edward H. Brown. Temperature tolerance of bloater (*Coregonus hoyi*). Jour. Fish. Res. Bd. of Canada 27(11):2047-2052. 1970.

1282. Learner, M.A., and R.W. Edwards. The toxicity of some substances to *Nais* (Oligochaeta).

1283 Mann, K.H. Heated effluents and their effects on the invertebrate fauna of rivers.

1284. Werner, A.E. Sulphur compounds in Kraft pulp mill effluents. Canadian Pulp and Paper Industry, 16(3):35-43. March 1963.

1285. Eisler, Ronald. Acute toxicities of insecticides to marine decapod crustaceans.

1286. Prins, J., and T.K. Nielsen. Microbial rennet. Process Biochemistry, pp. 34-35. May 1970.

1287. Kolb, Lawrence P. Ecological implications of dimethyl mercury in an aquatic food chain. Utah Water Research Laboratory Report PRWG105-2, Utah State University, Logan, Utah. June 1973.

1288. Reynolds, James H. A continuous flow kinetic model to predict the effluents of temperature on the toxicity of wastes to algae. Utah Water Research Laboratory Report PRWG105-3, Utah State University, Logan, Utah. October 31, 1973.

1289. Shifrer, Curt. Effects of temperature increase on the toxicity of wastes to fathead minnows (*Pimephales promelas,* R.). Utah Water Research Laboratory Report PRWG105-4, Utah State University, Logan, Utah. October 31, 1973.

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