

1966

NEWSLETTER  
No. 1SEC-TREAS  
COPYNEW ZEALAND LIMNOLOGICAL SOCIETY

This society was formed at a meeting in Christchurch in January, 1968. It aims to provide a common meeting ground for freshwater workers in New Zealand, and to encourage and promote the exchange of news and views between them. In particular, a newsletter and a list of research workers and their interests, will be compiled and circulated at least once a year.

The subscription is 50 cents per annum, and further information may be obtained from the Secretary/Treasurer.

The following committee was elected at the Christchurch meeting:

Chairman: Dr V.M. Stout (Zoology Dept., University of  
Canterbury, Private Bag,  
Christchurch).

Secretary/Treasurer: A.M.R. Burnet (Fisheries Laboratory, Kyle Sall,  
Christchurch).

Newsletter Editor: Dr M.A. Chapman (Zoology Dept., University of  
Auckland, P.O. Box 2175,  
Auckland).

Committee: Dr G.R. Fish (Marine Dept., P.O. Ngapuna,  
Rotorua);  
Dr D. Scott (Zoology Dept., University of Otago,  
King St, Dunedin).

### EDITORIAL NOTES

The function of this newsletter is to provide a means of contact between freshwater workers, both by giving any items of news of general interest to us, and by accounts of the projects on which people are actually engaged. We hope that this will lead to a much greater knowledge of freshwater activities in the country and to an increasing degree of cooperation between workers in the way of advice on techniques, comparison of results etc. The amount of enthusiasm and the support generated by the original circulars suggesting the formation of the N.Z. Limnological Society surprised the proposers. We had not realised just how much freshwater work was going on in the country. So far as I know, this is the first association of its kind, attempting to unite workers in all aspects of freshwater ecology, which has existed in New Zealand. Both in numbers and in public interest we have always suffered in comparison with, say, marine biologists, but it is becoming increasingly necessary to pay more attention to our freshwater habitats and to accumulate more basic data on them now before it is too late. The society now formally exists and it is up to all of us to maintain the initial interest and to cooperate in making the thing work.

We are endeavouring to find a suitable design for the front of this newsletter - something simple but artistically pleasing, and preferably symbolic of both the zoological and botanical sides of limnology. The committee has two or three designs to consider already but we would welcome a greater selection. All suggestions will be gratefully received, provided only that they are accompanied by suitably finished drawings. Inking and lettering are easily arranged, but artistic flair is not so simple. Anyway, here is a splendid

opportunity to immortalise your work and we hope you will take it.

In sending in their research notes for this issue a number of people added the comment that they wondered what they were going to say next time - to which the only possible reply is that we shall have to wait and see, and if the worst comes to the worst hope that people have short memories. The amount of detail included by individuals varied, as did style of presentation. I found impossible, and not even desirable, to achieve a uniform style throughout this section. We hope that contributors will feel free to add a few comments as to how their projects are going and what sort of results they are getting, without formally committing themselves. The policy of publishing short papers was briefly discussed at the foundation meeting but there was general agreement that we should not attempt to do so. The literature is sufficiently abundant and diffuse without adding to the confusion.

In future issues I hope that reviews on new books of limnological interest can be included, and I also wonder whether we can have any information on sampling equipment (other than simple nets etc) that is being made in New Zealand. For instance, I know of a commercial source of Ruttner bottles. Possibly others will know of local sources of other equipment. It could also be useful to know that such and such an article was made up in a department workshop, so that anyone else thinking of using the same gear could write for advice. It so often happens that a clothes peg or something equally simple can be substituted for an apparently irreproducible component, and much time can be saved if one knows about such improvisations. All ideas and contributions will be gratefully received.

M.A.C.



#### PROPOSED MEETING

Although the replies to the original circulars proposing the formation of this society indicated little enthusiasm for the holding of meetings considerable interest was expressed at the foundation meeting and the committee were directed to discuss the possibilities. There appeared to be few in favour of meetings held in conjunction with another society but it was thought to be an advantage to meet either immediately before or after other meetings.

The committee are considering organising a conference in August, possibly to follow after the Ecological Society meeting in Auckland. Circulars will be sent out as soon as possible giving further details.

#### INTERNATIONAL BIOLOGICAL PROGRAMME

Limnological interests in IBP are represented by Section PF (Productivity of Fresh Waters). This section is convened by Dr A. Hasler of the University of Wisconsin and has a full-time Scientific Coordinator Dr Julian Rzoska who is at the IBP Central Office in London. The New Zealand PF and PM (Marine) sections are combined in one section, PFM, convened by Dr R.M. Cassie who is also a member of the international PM committee and has been associated with many of the activities of PF, particularly the technical meetings. Other members of the committee with freshwater interests are Dr G.F. Fish and Dr Vida Stout. Dr Fish and Dr Cassie are also members of the National IBP



Committee. The present New Zealand PF program is summarised elsewhere in this issue.

The International PF Committee has been a particularly active one, perhaps the most interesting project from the point of view of New Zealand limnologists being the production of a series of handbooks on various aspects of technique. Each handbook represents the joint work of a number of specialists from all parts of the world who are brought together at a technical meeting to present their draft manuscripts for discussion and revision. It is expected that the following four handbooks will become available during 1968:

1. Primary Production. Pallanza 1965.
2. Biological Basis of Fish Production. Reading 1966.
3. The Chemical Environment. Amsterdam 1966.
4. Secondary Production. Prague 1967.

It is understood that a fifth on Microbial Production is being organised by Russian and Japanese limnologists.

I had the privilege of attending the Technical Meeting held in Prague under the Chairmanship of Dr W.T. (Tommy) Edmondson of the University of Washington, and Professor G.G. Winberg of Leningrad. The meeting was both stimulating and very hard work. The authors of the various chapters brought their manuscripts with them and after a thorough thrashing through various working groups were sent home with firm instructions to return the final drafts to Dr Edmondson within one month of leaving Prague. The setting of the meeting was the 19th century baroque castle of Liblice about 60 miles outside Prague. This is now owned by the Czechoslovakian Academy of Sciences,

and though now fitted with (fairly) modern plumbing and heating, still retains its frescoed walls and ceilings, crystal chandeliers and (fairly) authentic baroque furnishings. A less happy note was struck by the announcement of the death, a few weeks before the meeting of the previous PF Convener, Professor Vittorio (Toio) Tonolli of Istituto Italiano di Idrobiologia, Pallanza, Italy. To those who have had the privilege of meeting the Tonollis, it is some slight consolation to know that his work is being bravely continued by his wife, Professora Livia Tonolli who has been appointed to the position of Director of the Institute.

R.M. Cassie

I.B.P. - SECTION PF

The objectives of this section are to study the basic factors of production and metabolism, at all trophic levels, in standing and running waters both natural and polluted.

National programmes should endeavour to study each of the major trophic levels in at least one representative standing or running water in respect of:

- (a) Community structure
- (b) Biomass
- (c) Rates of biomass change
- (d) Factors controlling biomass change
- (e) Utilization efficiencies

In addition a number of specific topics have been listed as particularly suitable for inclusion in national PF programmes, such as Fish Farming, Wetlands, Large Impoundments, Toxic Chemicals, Detritus and Lake History.

The following projects are to be included in the New Zealand programme:

5.1 Rotorua Lakes - lake weed

Autecology and biology of the introduced lake weed, Lagarosiphon major.  
Effect of its eradication on phyto- and zoo-plankton.

V.J. Chapman, J.M.A. Brown, Vivienne Cassie, Ann Chapman

Department of Botany, University of Auckland.

5.2 Hydro-electric Lakes - lake weed

Autoecology and biology of the introduced lake weed, Ceratophyllum demersum.

V.J. Chapman, J.M.A. Brown, C.F. Hill, I. Johnston.

Department of Botany, University of Auckland.

5.3 Studies of lentic environments

Phytoplankton productivity in relation to the physical environment in  
(a) a freshwater impoundment, and (b) a natural coastal freshwater lagoon.

S.F. Mitchell, D. Scott.

Department of Zoology, University of Otago.

5.4 Studies of lotic environments

Phytoplankton productivity related to leaf fall, tree cover, pollution and geology.

D. Scott

Department of Zoology, University of Otago.



5.5 A limnological survey of Lake Grasmere, Canterbury, with occasional observations on Lake Pearson

Physical-chemical features, plankton and productivity together with a study of fish populations and productivity.

Vida M. Stout, Elizabeth A. Flint, D. Hogan, plus two graduate students.

Department of Zoology, University of Canterbury.

5.6 Comparative limnology - North and South Island

Effect of latitude and other factors on biological production and inorganic cycles of selected lakes. Sampling and analytical methods will be correlated. Some significant criteria will then be selected and used to evaluate the data available to provide a valid basis for comparison of the lakes.

G.R. Fish, Vida M. Stout, Ann Chapman

Marine Department; University of Canterbury; University of Auckland.

It is planned to extend these comparisons to similar situations in Australia.

AUSTRALIAN SOCIETY FOR LIMNOLOGY

This society has recently published a useful booklet of keys to the genera of Crustacea found in inland waters (see bibliography). Further information about this and on the society in general may be obtained from the Secretary-Treasurer, c/- Department of Zoology and Comparative Physiology, Monash University, Clayton, Victoria.

The society is holding a meeting at Renmark, near Mildura, on May 18-20.

## RESEARCH NOTES

### University of Otago, Zoology Department:

Since B.J. Marples first occupied the chair of Zoology in 1937, there has been a marked interest in freshwater studies and at the present time this field is flourishing. For this issue an outline of the lines of research in progress will be given, and subsequently some of these will be discussed more fully. It is hoped also to obtain details of fishery work being carried out in the Southern Lakes district.

Dr. Scott is interested in migratory populations of Salmo trutta, and also has a number of other projects under way:

Development of rainbow trout in Mahinerangi Dam. This will include observations on their migratory behaviour and relation to Salmo trutta.

Inbreeding in fish populations. Small isolated populations of Salvelinus fontinalis and Salmo gairdnerii showed marked inbreeding and this may be related to upstream migration.

Dr. Scott and I.K. Latta (Ph.D. student): Ecological effects of willows on trout streams.

Dr. Scott and J.C. Dacre (M.R.C.): Dieldrin pollution of the Silverstream.

Dr. Scott and Miss A.P. Wylie (Botany Dept.): Chromosome number of Te Anau Atlantic salmon.

Dr. Scott and G. James (M.Sc. student): Distribution of fish fauna in relation to altitude.

Dr. Scott, K.W. Duncan (Zoology Dept., Canterbury), and

G.M. Barr (B.Sc.Hons. student): Interrelationships of shags, perch and trout in Mahinerangi Dam. A long term experiment on predation and competition.

M. Merrilees (Ph.D. student) is working on the adaptations to terrestrial locomotion in Galaxias.

W.J. Clark (B.Sc.Hons. student) is working on respiration in Salvelinus fontinalis.

Dr. S.F. Mitchell is extending his Ph.D. work on primary production in lakes.

B. Nayer (Dip.Sci.) is making a survey of zooplankton in Tomahawk Lagoon.

T.M. Wong (B.Sc.Hons.) is working on ionic and osmotic regulation in the freshwater crayfish.

University of Canterbury, Zoology Department:

Staff:

Mrs. F.R. Allison (Miss Nurse) has worked for a number of years on freshwater platyhelminthes and continues studies on their taxonomy, especially of triclads and rhabdocoels.

Dr. V.L. Benzie has several papers on the life-history of Galaxias in press, and is now in England on a year's leave of absence.

K.W. Duncan's freshwater work centres on the interactions of brown trout, perch and black shags in Lake Mahinerangi (Otago).

This is a very long term project which is aimed at revealing the effect of predation by the black shag on the game fish stock. In Mahinerangi perch tend to be a nuisance as they



are small and numerous. As a control measure shags have been protected from 1963.

Professor G.A. Knox has been supervising work on freshwater fish and on pollution in the lower reaches of the Heathcote River. The latter study is by Mrs. J.E. Cameron, a student in the department, who is completing her report on a biological survey of the lower reaches of the Heathcote River made during the summer of 1967/68 and carried out in association with the Christchurch Drainage Board. The report deals with work at 22 stations and covers chemical and bacteriological analyses and the distribution of microorganisms and macrofauna.

Professor R.L.C. Pilgrim is studying the life-history of Choristella philpotti Tillyard 1917 (Insecta:Mecoptera)

Interest in this little-known, sole member of the order in New Zealand was aroused by the accidental finding in 1957 of a pupa in a small high-country stream in the Hawdon valley. The pupa, which was unrecognised until emergence followed, was found embedded in very wet moss on a partly submerged log. Subsequent collections yielded numerous pupae, some of which were allowed to emerge producing adults of both sexes. A few late larvae were also found in similar sites; some were pharate when collected and a few moulted into pupae, confirming their identity. Recently, examination of apparently comparable streams has led to the finding of larvae, pupae and adults in the Haast Pass area.

The sites occupied by late larvae and by pupae, just above the water line on logs, suggested that earlier stages might be aquatic, even though this habit is quite unknown for any other mecopteran.

In February 1968 numbers of very small larvae, representing several instars, were taken from the Hawdon stream where they were found to be relatively common in the silt of the stream bed. In all essentials they are identical with the last instar larvae now proven to be Choristella philpotti.

Dr. V.M. Stout is (1) finishing work on a survey of several

Canterbury lakes throughout the year done in conjunction with the Chemistry Division, D.S.I.R., Christchurch and Dr. E.A. Flint of the Soil Bureau.

(2) completing a study of three small lakes near the department's field station at Kaikoura. These have been studied mainly with regard to their plankton.

(3) beginning a long term study of Lake Grasmere, Canterbury, part of an IBP program and due to continue for several years, with associated student theses.

Dr. H.B. Wisely has returned to Canterbury after several years in Australia and plans to do some work on the life histories of freshwater invertebrates.

Dr. E.C. Young continues work on flight muscle polymorphism in Corixidae and Notonectidae, and is also now interested in mouthpart polymorphism in Opifex fuscus, the supralittoral mosquito. A paper on eye growth in Corixidae has just been completed.

#### Ph.D. Students:

Miss Jean von Bernuth, recently arrived from the University of Washington, is beginning work on the phytoplankton of Lake Rotorua, Kaikoura and Lake Grasmere, Canterbury, including keeping some of the algae in culture.

D.J. Staples is beginning a study of the biology and population dynamics of Gobiomorphus breviceps in Lakes Grasmere and Sarah. C.S. Woods has recently completed a Ph.D. degree with his work on the systematic biology of Gobiomorphus, with supporting studies on Retropinna and Galaxias. He has now left to take up a research fellowship at the University of Manitoba, Winnipeg.

B.Sc. (Hons) Projects:

B.J. Ayers is working on the survival of animals in temporary ponds. A.G. Clark is working on the invertebrate fauna of part of the Selwyn River and the effect of flooding. W.J. Crumpton is studying food and food preferences in Gobiomorphus. J.A. Nield is studying growth rates and competition in Daphnia, Moina, and Simocephalus.

Dr. E.A. Flint is working in the Botany Dept., Canterbury University, and employed by the Soil Bureau, D.S.I.R.; her work on algae in freshwater is subsidiary to that on algae in soils and consists of the following:

- (1) a contribution to a larger survey of lakes in Canterbury and at Kaikoura,
- (2) a study of the possible effect on the phytoplankton of top-dressing part of the catchment area of the hydro-electric reservoir,
- (3) some species, especially of Chlamydomonas, are cultured,
- (4) when available, the troublesome algae of swimming pools are identified and related to the kind of swimming pool and the chemical treatment of the water.



Canterbury Museum, Christchurch

Mr. J.G. Penniket and Mr. A.G. McFarlane, assisted by Mrs. Faye Tunnicliffe, are currently engaged in taxonomic research on aquatic insects. In the case of mayflies, stoneflies and caddisflies, emphasis is on rendering adults and, where possible, larvae identifiable to species. In all three groups many new species are involved. In other aquatic insect groups, the emphasis is on rendering the larvae identifiable to family, then genus, and ultimately species. Unpublished results are available to limnologists in the form of cyclostyled keys known as KANZI Keys, an abbreviation for Keys to Aquatic New Zealand Insects.

These three workers are also engaged upon a projected work to be entitled The Minor Orders of New Zealand Insects. In the case of twenty-odd orders (that is, all except Diptera, Coleoptera, Hymenoptera, Hemiptera and Lepidoptera) appropriate specialists have been persuaded to contribute chapters in revision or review form. Many of these chapters are now complete.

Entomology Division, D.S.I.R., Christchurch

Mr. L.J. Dumbleton is now writing up work of the N.Z. sandflies of the genus Austrosimulium (Dipt. Simuliidae) for publication. A synopsis of the N.Z. mosquitoes (Dipt. Culicidae) and a key to the larvae is in draft form. A new species of Ephydrella (Dipt. Ephydridae) from hot spring waters with temperature up to 50°C in central North Island is being described.

Northern and southern distributions of Blepharoceridae have been extended to Coromandel Peninsula and Stewart Island.

Chemistry Division, D.S.I.R., Christchurch

For a number of years this Division has been making detailed chemical analyses of South Island lake waters for the Zoology Department of the University of Canterbury. A few lakes have been sampled regularly for several years and a large number of analyses is now available for evaluation on a seasonal basis.

Botany Division, D.S.I.R., Lincoln

Miss R. Mason is continuing her survey of water plants in New Zealand.

Fisheries Management Division, Marine Department, Christchurch

A.M.R. Burnet - Biology of Trout with Special Reference to Factors Affecting Population Numbers

The programme has involved a study of the relation between freshwater eels and trout. It has been shown that in some situations eels are limiting the trout numbers. When eels are removed the trout numbers increase, and the growth rate decreases, resulting in numerous small fish. The programme is now being continued to study the relationships between growth rate and population density in a trout population, and to determine the maximum cropping level which can be maintained. Fish obtained from the cropping are being released in other rivers to give information on growth rates, and data on the anglers' catch in heavily fished areas.

Malcolm Flain - Lake Coleridge Investigation

The management of Lake Coleridge, a large, deep, high country lake in the South Island, is being investigated. Regular sampling

of temperature, oxygen, pH, and light penetration is carried out. Plankton samples are being taken and the benthic fauna is being sampled in the shallower water using underwater diving techniques and at greater depths with an Eckman Grab. A bathymetric survey will be carried out with an echo sounder. Underwater diving is also being used to make estimates of the bully population of the lake. Intensive surveys of the anglers' catch have been carried out on each opening weekend, when the fish caught have been measured and the scale samples collected. The scales are being examined to give information on growth rate of the fish and age composition of the catch.

#### Malcolm Flain - Age Determination of Quinnat Salmon (Rakaia River)

Data on the age determinations from otolith readings for Quinnat salmon in the Rakaia River since 1965 have been compiled, and will be published by the Marine Department. Most of the otoliths are from fish which pass through the Glenariffe trap, and some comparative material from angler caught fish is now being collected. The results are being compared with those of earlier workers, and with the collection of salmon scales held by the Marine Department. The reading of the otoliths has been considerably assisted by the development of a technique of staining the otoliths with Fluoresceine.

#### South Island Technical Field Service

The technical field service investigates fisheries management problems in the South Island. Their main programme at present is the operation of a fish trap on the Glenariffe stream which is a tributary of the Rakaia River. The purpose of the trap is to



obtain basic data on the Quinns Salmon run. Each year the number of fish spawning in this area is counted through the trap, the fish are measured, weighed and tagged, and after they have spawned the dead fish are recovered and the otoliths removed for examination.

Estimates of the number of redds in this stream, and in other salmon spawning areas are made each year.

A downstream trap is now in operation at Glenariffe and the results from this trap will give a measure of the spawning success. Information is being collected on the conditions in the stream, and a proposed programme involves the testing of measures which could improve the survival of juvenile salmon.

Fisheries Research Division, Marine Department, Wellington

Mr. C.L. Hopkins has been working on the bionomics of a trout nursery stream in the Wairarapa district, with the main emphasis on the feeding relationships of the fish species present in the system (Brown trout, Philypnodon breviceps and the two species of eels). The data collected by bottom sampling (1 sq foot Surber) and electric fishing has enabled him to evaluate the density of the benthic food supply at different seasons, growth, density and mortality of the fish, and food requirements of the fish and qualitative differences in their feeding. Part way through the field programme, DDT was applied to the catchment and he has also been studying the changes in prey and predator populations consequent on this. The data are now in the process of being written up.

Victoria University, Zoology Department

Mr. S. Moore is currently working on the systematics of the common New Zealand mayfly genus Deleatidium (O. Ephemeroptera, Family Leptoplebiidae), including a revision and descriptions of new species. The closely allied taxon Atalophlebioides is also being investigated. All stages of the life cycle are being described and many characters used. Some nymphal ecology is being undertaken.

\*(See last page of Research Notes)

Massey University, Zoology Department

Mr. M.J. Winterbourn is (a) completing Ph.D. work on the systematics and biology of Potamopyrgus, and (b) examining Hydrophilid beetles and their larvae from thermal waters in an endeavour to sort out their taxonomy. He is also arranging class projects for students: during the first term Advanced Zoology undergraduates have been making a comparative study of eutrophic and oligotrophic ponds with emphasis on community structure and production, and also a biological evaluation of pollution in Tiritea and Kahurere Streams which is a continuation of a programme begun by students in 1967.

Fisheries Research Division, Marine Department, Rotorua

Dr. G.R. Fish is collecting data from Lakes Rotorua and Rotoiti to estimate the annual changes in heat, oxygen, phosphorus, nitrate, phytoplankton and zooplankton. Dr. U.V. Cassie and Dr. M.A. Chapman (both of Auckland University) are also assisting in the plankton work.

Fisheries Management Division, Marine Department, Turangi

Mr. C. Larsen is conducting biological studies and surveys in relation to the Tongariro hydro-electric project. He is reporting on the adverse effects of the project construction on fishery resources of the area, and determining measures for the improvement of conditions or the prevention of losses which should be included in project plans. Studies include fishery surveys of the Tongariro and Mangianui Rivers and their tributaries, and a biological survey of Lake Rotoaira.

Auckland Regional Authority

Mr. R. Hicks is the Chief Chemist and Treatment Works Superintendent attached to the Works Division of the Auckland Regional Authority. He is responsible for the satisfactory operation of a large oxidation pond system and hence is particularly concerned with the biochemistry of fermentation and uptake of nutrients by plants. He is especially interested in problems of eutrophication.

Mr. Hicks is a Member of the Governing Board of the International Association on Water Pollution Research and so is able to keep in close touch with international research work in this field.

The current work of Mr. A.W.V. Haughey includes aspects of the operation of sewage oxidation ponds at Mangere and analysis of regular phytoplankton counts. Regular surveys of a disused fifteen acre treatment pond at Manurewa which is reverting to a "natural" freshwater lake are also being carried out. This latter pond is rather interesting in that an extensive growth of Lagarosiphon major occurred about eighteen months after diversion of sewage.

Auckland University, Zoology Department

Particular fields of interest in this department are Crustacean systematics and ecology, biology of aquatic insects and fish.

Mr. D.R. Cowley is making systematic studies on the immature stages of N.Z. Trichoptera. Mr. P.H. Norrie (M.Sc. student) is working on the flight activity and emergence of mayflies and caddisflies by means of regular light trapping in Cascade Stream in the Waitakeres.

Miss S.I. Cherry (M.Sc. student) is studying structural and behavioural aspects, especially in relation to feeding and activity, of Gobiomorphus basalis. Mr. C. Hatton (III B student) is beginning a study of feeding and diet in smelt from Lake Waikare and the Waikato River.

Miss M.H. Barclay is interested in pond ecology, and the systematics of N.Z. freshwater Entomostraca, particularly the harpacticoid copepods. She is at present working on the systematics of this group with the aim of producing a list of N.Z. species, including those living in the interstitial habitat on lake and stream shores and amongst moss on rock faces in streams, swamps and bogs as well as in damp terrestrial moss.

Dr. M.A. Chapman is combining with Dr. G.R. Fish and Dr. U.V. Cassie in a study of Lakes Rotoiti and Rotorua and is analysing the seasonal cycles of the zooplankton, paying particular attention to the calanoid copepod Calamoecia lucasi in order to get some estimate of the annual turnover of this species. Mr. J.D. Green (M.Sc. student) is working on plankton ecology in water storage dams in the Waitakeres, particularly the feeding relations and phenology of the

zooplankton. Miss L. Edwards (III B student) is beginning a study of respiration and haemoglobin production in Simocephalus. Mr. W. Donovan (III B student) is making a survey of the zooplankton of Lake Waikare and the Waikato River in the Rangiriri area.

Auckland University, Botany Department

Professor V.J. Chapman: Study of biology of aquatic water weeds, in particular Lagarosiphon major, Egeria densa, Ceratophyllum demersum, Nitella hookeri.

Biological control of water weeds by means of grasscarp and giant snail, Marisa cornuarietis.

Dr. U.V. Cassie is making routine counts and identifications at monthly intervals from preserved samples collected by officers of the Marine Department from the Fisheries Research Division at stations in Lakes Rotorua and Rotoiti. It is hoped to incorporate information from fresh samples as well this year. A paper on the seasonal fluctuations in these lakes in 1966-67 is now in press (N.Z.Jl.mar. Freshw.Res.).

C.F. Hill (Ph.D. student): Biology and ecology of Ceratophyllum in relation to nutrients and water movement of hydro-electric lakes.

M.B. Starling (M.Sc. student): Growth of Nitella hookeri in relation to temperature, light and nutrients.

I.M. Johnstone (M.Sc. student): Biology and control of water fern, Salvinia auriculata.

Leigh Marine Laboratory, Auckland University

Dr. F.J. Taylor is principally concerned with marine plankton,



and is studying the seasonal variation in phytoplankton and nutrients in in-shore waters around Leigh. A check list of the marine diatoms of N.Z. waters is in the final stages of preparation. Irregular plankton samples are also being taken from various lakes in the district.

Freshwater Research in D.S.I.R.. (Dr. D. Spiller)

Following a recommendation of the National Research Advisory Council concerning the research effort desirable within the limnology, freshwater, waste treatment and pollution fields, the Department of Scientific and Industrial Research is beginning to put together a research organisation for this work. A start was made in January 1967 and some research funds are being allocated for these purposes. The original suggestion was that there should be a two year reconnaissance of the freshwater field to pin-point existing problems and to orient the D.S.I.R. as to what research areas warranted the first attention. However, after some work on this reconnaissance it was considered that the initial effort would be most profitably spent on tackling some of the obvious and pressing problems which themselves must require more research time than can yet be given to them.

The current projects are

- a. A laboratory investigation of the nutritional ecology of the midge Chironomus zealandicus.
- b. Control of the above midge in various Auckland oxidation ponds, a major problem in previous years but now almost entirely solved.

c. Preventing the layering of sea water under the freshwater in the cooling water pond of the Otara gas turbine station. If layering becomes a feature of pond operation it is to be expected that sulphide type smells would arise from the oxygen depleted sea water pool.

d. The weed Lagerosiphon major in Lake Rotorua and Lake Rotoiti. Here the concern is to formulate acceptable proposals for chemical control of the nuisance weed as an interim solution to a problem that has attracted too much publicity and too little action. It has long been known that adequate control of nuisance weed can be obtained with moderate amounts of the weedicide diquat, but there has been much concern at the possibility of adverse side effects on other organisms.

An adequate programme for the management of nuisance weed requires the accurate and objective mapping of the nuisance areas both as to location and as to amounts. This is being attempted by the remote sensing approach, the beds and areas being repeatedly photographed from the air. The techniques of photographing weed in water present considerable problems in themselves and the numerous variations of colour film, black and white, infra red and false colour film are being explored.

As the D.S.I.R. freshwater programme expands it is hoped to give considerable encouragement to freshwater research within the Universities by providing studentships, grants for advanced degrees and possibly research contracts.

This freshwater activity of D.S.I.R. is being led by Dr. Don Spiller at the D.S.I.R. Mt Albert laboratory, who is best known for

his successful direction of the Midge Research and Control Programme which removed the midge problem from the Mangere oxidation ponds and the North Shore pond. The University of California have just published his study on "Mosquito Problems in California's Central Valley" which he prepared at the request of the Department of Entomology and Parasitology, Berkeley, while he was Visiting Research Scientist there in 1965.

#### Other News

Professor J.G. Pendergrast (Zoology Department, Auckland University) is in North America. He will be returning in May.

Mr. R. McDowall (Marine Department) is completing a Ph.D. degree at Harvard. He has been working on the systematics of the Galaxiidae of the southern hemisphere.

Mr. I.D. McLellan of Westport is spending a year overseas visiting workers on Plecoptera - including Dr. J. Illies, who recently spent some time in N.Z.

#### \* Victoria University, Zoology Department

Since 1964 Alan N. Baker has had a part-time interest in the systematics, ecology and distribution of freshwater algae in Antarctica. He plans to continue working up algal collections from the Victoria Land lakes.

#### \* Dominion Museum, Wellington

Mr. R.G. Ordish is currently preparing a systematic revision of the New Zealand Hydrophilidae and also continuing to work on the systematics of the Dytiscidae (Coleoptera), their larvae, and their distribution.

## REQUESTS FOR MATERIAL

Miss M.H. Barclay of the Zoology Department, Auckland University, would be grateful for harpacticoid copepods from any freshwater or terrestrial habitat. The animals should be preserved in 60% alcohol with data giving locality, habitat, date and collector included.

Dr M.A. Chapman, of the same department, would be interested in specimens of cyclopoid copepods, preferable preserved in 4% formalin, from any freshwater habitat.

## BIBLIOGRAPHY

One of the suggestions made at the initial meeting of the society was that a complete bibliography of all papers published on any aspect of N.Z. freshwater ecology should be compiled. The foundation for such a bibliography exists already in the form of a catalogue compiled by Professor B.J. Marples, which has been handed on to Dr D.J. Scott of the University of Otago. The committee has yet to discuss fully the question of compiling, editing and we hope, publishing such a list but in the meantime we hope that members, many of whom must have got together their own personal bibliographies in specific fields, will give serious thought to this matter. It is probable that the committee will invite particular people to be responsible for assembling references to all papers dealing with their fields of interest, and an editor to be responsible for collating the lists. It will have to be a cooperative effort but once accomplished will eliminate much of the drudgery at present necessary in checking on earlier work.

It is also hoped that a current bibliography of recently published papers on N.Z. freshwater work, together with relevant overseas work (e.g.



taxonomic or ecological work on Australian species will often be of direct interest to us) can be included once a year in the newsletter. Contributions to the next issue should include details of any papers published this year.

A list of papers published in 1967 is given below, although we realise that it is incomplete as yet.

- Bayly, I.A.E. (1967) The fauna and chemical composition of some athalassic saline waters in New Zealand. N.Z.Jl. mar. Freshwat. Res. I : 105-117.
- Bayly, I.A.E. (1967) A new species of Boeckella (Copepoda: Calanoida) and additional comments on some other species of the genus. Papers & Proc. Roy. Soc. Tasmania. 101:97-101.
- Bayly, I.A.E. et al (Editors). (1967) An Illustrated Key to Genera of the Crustacea of Australian Inland Waters. Australian Society for Limnology.
- Burnet A.M.R. (1967) Electric Fishing Equipment Design Notes, Fisheries Technical Report No. 19.
- Chapman, V.J. & Bell, C.A. (1967) Rotorua and Waikato Water Weeds. Problems and the search for a solution. (Proceedings of the Rotorua Seminar on Water Weeds, Oct.15, 1967). Dept of University Extension, University of Auckland.
- Green, J.D., Norrie, P.H. & Chapman, M.A. (1968). An Internal Seiche in Lake Rotoiti. Tane (Journal of the Auckland University Field Club).
- Hardy, C.J. (1967) The Fecundity of Brown Trout from Six Canterbury Streams. Fisheries Technical Report No. 22.
- Hopkins, C.L. (1967) Breeding in the freshwater crayfish Paranephrops planifrons White. N.Z.Jl. mar. Freshwat. Res. I : 51-58.



- Hopkins, C.L. (1967) Growth rate in a population of the freshwater crayfish, Paranephrops planifrons White. N.Z.Jl. mar. Freshwat. Res. I : 464-474.
- Kiefer, F. (1967) Cyclopiden aus salzhaltigen Binnengewasser Australiens (Copepoda). Crustaceana 12 (3) : 292-302.
- Mason, R. (1967) The species of Ruppia in New Zealand. N.Z.J. Bot 5(4) 519-531
- Scott, D. & K.W. Duncan (1967) The function of freshwater crayfish gastroliths and their occurrence in perch, trout and shag stomachs. N.Z.Jl. mar. Freshwat. Res.I : 99-104.
- Timms, B.V. (1967) Ecological studies on the Entomostraca of a Queensland pond, with special reference to Boeckella minuta (Copepoda:Calanoida). Proc. Roy. Soc. Queensland. 79 (5) : 41-70.
- Winterbourn, M.J. & M.W. Cawthorn (1967) Observations on the faunas of two warm streams in the Taupo thermal region. N.Z.Jl. mar. Freshwat. Res. 1 : 38-50.