

WATER POLLUTION RESEARCH

ng taken from
river. Samples
area just below
Florenceville,
ream and from
downstream, near
ording to Dean
es are relatively
at there is "no
mediate area".
Mactaquac Dam
is studied to
which normal
the river decom-
ances, particu-
ellulose, starch
analytical tech-
ee how rapidly
ken down and
affect them.

McCain's, they
processes in de-
le of bacteria
n is dependent
rious kinds, not
ists hope to de-
al factors that
and then use
with other data,
waste treatment.
mechanisms in-
ed that they will
ge of them. In
determine just
local ecosystem,
multiplication,
ater of oxygen.
hat a fact not
hat the bacteria
important factor
plankton (small

n organic com-
e inorganic com-
ed by algae and
ncentrations of
stimulates the
h as algae, which
s eutrophication
moving bodies of
are no significant
ohn, as the run-
ner.

s are taken right
reatment facility.
they should have
ties installed but
nown at present
they can. If this
y effective meth-
e applied at Mc-

s in improving their waste treatment.

fter the samples of water, containing
eria, have been brought back to the
the researchers do a complete chem-
as well as a biological, analysis. In
lab work they keep the samples as
to natural conditions as possible.
piece of lab equipment employed
is a Controlled Environment Incub-
Shaker which keeps the liquid sam-
moving, simulating river action, and
keeps them at the proper river
perature.

This study is a very important one in
the researchers are developing tech-
ues that have never been used before.
Franklin hopes that their findings
be as beneficial as possible in pro-
ting a better understanding of the St.
n River as an ecosystem and in con-
lling the condition of the wastes dis-
rged into it. The study is taking much
ger than was originally expected but
s felt that the more time spent will,
efully, supply more scientific know-
ge.

The cooperation from McCain Foods
nited has been "very very good" ac-
cording to Dean Franklin. They have
ne out of their way to assist the re-
rch team from UNB in any way they

Dr. Page and graduate student Greg
acock are in the process of treating
tato waste from the McCain Foods
nited plant in Florenceville. This work
being done by Mr. Peacock for his
sters degree, with Dr. Page as his
ervisor.

The samples of water from the plant
e taken after the pollutant has passed
rough primary treatment, which re-
oves the solid particles, just before re-
ming to the river. The liquid waste is
en being treated with the fungus
sarium, which, after 4 days, removes
e starch, carbohydrates, and amino
ds from the effluent. This procedure
o produces two substances. One is
paraginase, which is an enzyme used to
mporarily retard leukemia in humans.

The other is a plant growth hormone,
gibberellins.

In the past, pure amounts of this
hormone have been used to promote the
growth of blueberries. By spraying this
on blueberry crops, at a cost of \$500
an acre, the plants self-fertilize without
bees having to spread the pollen. Because
of the seemingly shortage of bees in New
Brunswick, this type of self-fertilization
is an excellent alternative.

What our researchers are trying to do
is produce this hormone at a cheaper
cost. They have already sprayed their
decanted effluent, containing crude a-
mounts of gibberellins, on blueberries,
resulting in 50 per cent fertilization. If
the hormone can be sprayed on fields in
this crude condition, with no ill-effects
produced by the remaining effluent to
the soil, it would be more economical
than the present method.

Ideally, what is desired is to somehow
put the enzyme on a gelatinous matrix
and then use it to treat the waste, rather
than having large amounts of fungus
around to do it.

The researchers have been given a
free run of the McCain facility and the
company seems to be quite interested in
the project.

Another project undertaken with fun-
gi in the St. John River is being carried
out by Dr. Whitney and Dr. Ansar
Qureshi. This one began about two years
ago as a survey of polluted rivers and
streams in the province. The objects of
this project are:

1. To determine the types and popula-
tion of fungal species in polluted
waters.
2. To study the nutrition of such fungi
in relation to their ability to decom-
pose specific pollutants.
3. To investigate the possibility of us-
ing fungi as agents for controlling
pollution.

Fungi possess the ability to breakdown
substances such as lignins, chitin, pectins,
hemicellulose, and cellulose and as such
can play a very important role in the
decomposition of organic waste pro-

ducts in properly operated biological
waste treatment processes. This possibil-
ity is to be studied in the last phase of
their research work.

In the first phase of the study, about
two hundred isolates of fungi were ob-
tained and identified from various water-
ways in New Brunswick. Last summer,
the biologists narrowed down the field
of study and concentrated on the pollu-
tants at the pulp and paper mill at Nack-
awic. More samples were then taken of
the water, before and after its' use by
the mill.

Samples were taken before the water
entered the plant, from the primary pol-
lution treatment (sedimentation) lagoons,
and also after the secondary treatment
(aeration), just before the water re-enters
the river. One hundred or more isolates
of fungi were made from these samples.
They are presently testing these isolates
on their ability to decompose specific
pollutants. Their aim here is to break
down the effluent in the lagoon, by
using fungi, so that the water may be re-
turned to the river in its' original condi-
tion.

The Nackawic mill is giving Dr. Whit-
ney and Dr. Qureshi excellent co-opera-
tion and they are very interested in the
results of their experiments.

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